

NEW ZEALAND JOURNAL OF AGRICULTURE

Vol. 65.

WELLINGTON, SEPTEMBER 15, 1942.

No. 3.

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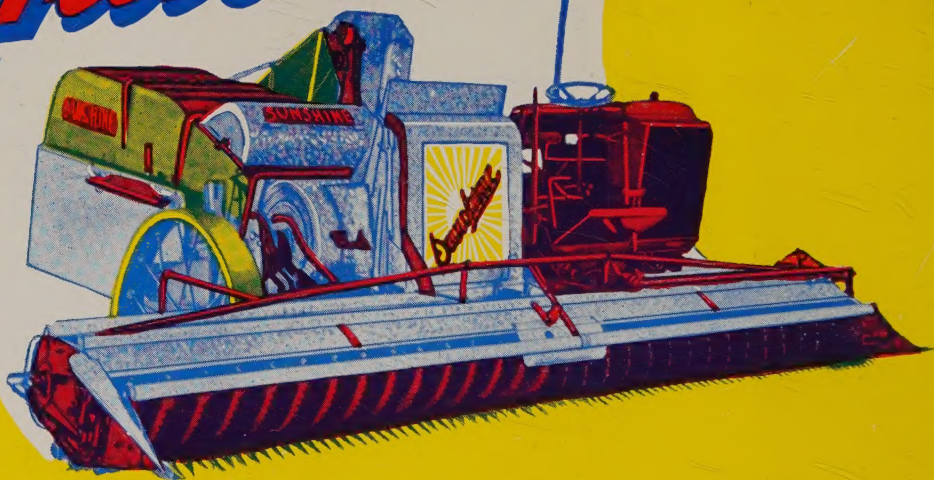
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WRITE FOR COLOUR CATALOGUE

Organising The Primary Production Front

I WANT to tell my fellow-farmers how they can help in the greatest and most essential drive for diversified production hitherto attempted in the Dominion. It is a great war drive that is beginning, to enable us to fulfil the food requirements of our splendid allied fighting forces in and around New Zealand and also to grow such adequate crops as will ensure that we will not again need to go without such necessary vegetables as potatoes in the future.

For the successful prosecution of this undertaking we have obtained the co-operation of the Primary Production Councils throughout New Zealand, who have been given new responsibilities and a definite task to do. The response of these farming organisations has been a source of great satisfaction to the Government and to myself as Minister in Charge of Primary Production and food supplies.

No one understands the problems of production better than the farmers in their districts do themselves. They have experience behind them. What they are asked to do now is to organise through their own Councils and deal

—By—

THE HON. W. J. POLSON,
Minister of Primary Production
for War Purposes.

with the questions which affect the physical side of production as their combined knowledge suggests they should be dealt with. These councils will constitute themselves greater rural local bodies building up by their combined efforts a greater and stronger production programme than has hitherto been the case, becoming, in fact, district parliaments of production.

Increases Wanted

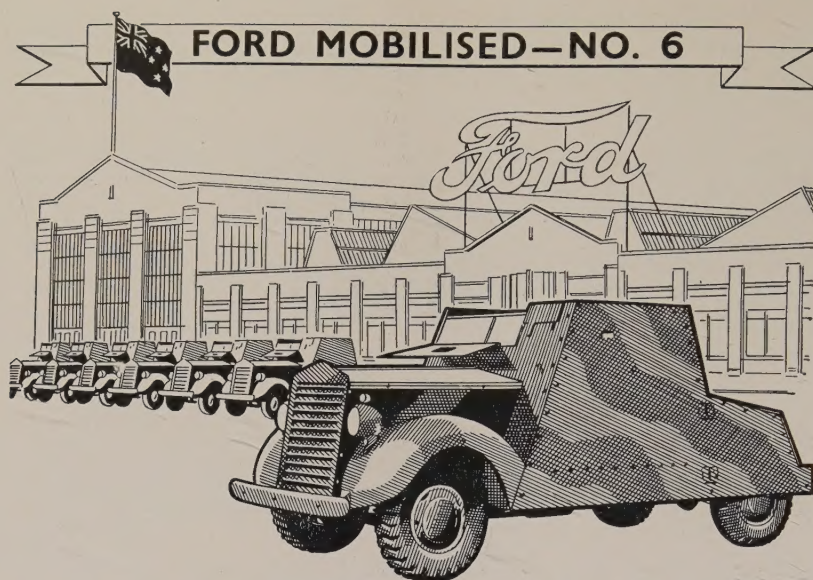
The programme includes increased production of grain—wheat, barley, and oats, increased production of pork and bacon, and increased production of fruits and vegetables—an enormous increase of 10,000 acres of vegetables—and a diversification of our farming system that will need careful and continuous organising.

Into that organisation come not only the Department of Agriculture with its survey of the areas where crops can best be grown, but the Department of Supply to see that the requirements of such a programme in regard to seed,

canning, and machinery are met and the Marketing Department to provide price minimum for all the different types of production from eggs to onions which the farmers are asked to grow so that they can confidently undertake the work, knowing that there will be a reasonable reward for their labour. Last but not least comes the Department of National Service providing the liaison with the Army so that essential man-power may be borrowed to enable the work to be carried out.

What is entailed in all this is best illustrated by a reference to the demands made upon the canning industry alone, to overlook for a moment the vastly greater quantities of fresh meats and vegetables that will be needed. The cannery are asked to can in addition to their normal output which is already greatly expanded, an additional 3500 tons of beans, 1200 tons of peas, 3200 tons of tomatoes, 1600 tons of cabbages, 3200 tons of fruit and jams, 500 tons of fruit juices, and 8600 tons of powdered and evaporated milk products.

Apart from these quantities we need an additional 5000 tons of onions and 4,000,000 dozen extra eggs. In meats the additional requirements mean 11,000 tons more pork and bacon to feed our fighting forces and still greater quantities of beef, mutton, and lamb. Flour alone will mean another 14,000 tons, to say nothing of such important items as butter and cheese.



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Pork and Bacon

To deal first with pork and bacon, an industry which was seriously affected by the swing over from butter to cheese, two years ago, and which now must be rapidly re-established. An increase of 20 per cent. on our present production is aimed at this year.

Since it requires upwards of a year from mating time before porkers are available, the extra production can best be achieved by putting extra weight on to all pigs before slaughtering them. On last year's figures an extra 11lb. per carcass would produce 500 additional tons. We want more baconers anyhow, and increasing the weight by 20lbs a pig would give us the meat we require and convert many porkers into baconers. We want farmers to increase their breeding sows to the utmost.

All this cannot be done without food supplies and here the production councils can help greatly. Their main objective is to increase production and such roots as can be grown on the farm, farmers will be encouraged to grow. They should attempt to grow at least five tons of roots for every sow kept.

The Department will play its part by obtaining grain supplies. Already a great quantity has been purchased and as shipping is obtainable will continue to arrive in the Dominion. Meat for pig food will be obtainable as the season progresses. But grass is the main basis of all New Zealand's primary production, and farmers should make as much use of it as they possibly can.

District Quotas

Production Councils working to a plan provided by the Department are seeking to increase such production as their areas can best supply. Allocations of increased quantities on these lines have already been made, always keeping in mind transport difficulties and the necessity for production being greatest where it is most required and can be most easily and econo-

mically dealt with. Potatoes are an example of how this works out. One district allotted 500 extra acres has already announced that its quota has been obtained; another that its quota of 200 acres has been filled.

In addition to autumn planting, wheat, barley, and oats in increased quantities are being included in the spring sowing, and here, again, Production Councils will assist in procuring the essential labour for harvesting and, in some cases, in organising the best use of the machinery required. We need still more wheat to make New Zealand self-supporting. Last year our acreage was 250,000, but with a normal crop we actually need 300,000 acres, and would welcome more than that. Our objective in linen flax is 25,000 acres and Production Councils are co-operating in an endeavour to get it.

We want 6000 acres of feed barley grown in the North Island and, like wheat, for which the Minister of Supply has raised the price 4½d per bushel, minimum prices have been fixed for barley at 4s 3d in the North Island and 3s 9d in the South, both free on rail, sacks in. Oats, too, are included at good minimum prices in this appeal.

There will be a great demand for peas and beans and onions, as well as other necessary vegetables, and in every case the farmer will be protected by these adequate minimum prices.

It is too late, of course, for districts where autumn-sown crops are grown, like the Pukekohe onion crop, but Marshlands and Shannon sow their onions in the spring and so can other areas. Beans, peas, tomatoes, cabbage, beets, etc., can be grown in Otago, Hawke's Bay, Nelson, Wairarapa, and Auckland, where canneries exist, as well as in other districts where arrangements can be made to handle them and where supplies of peak vegetables for the Army will be needed.

Maori Effort

To the Maori people I have already made a special appeal. We want them to plant every seed potato they can lay their hands on and in the maize-growing districts are asking them to again grow 10,000 acres of maize as they did two years ago. The corn is needed and the price is right. But most particularly we want them to grow kumeras, a product in which the East Coast people and the Northern people excel. We require nearly 2000 tons of these sweet potatoes and, with their usual good will our Maori people are already busily engaged in this work, which bears early evidence that it will be a success. They are receiving assistance in obtaining the essential things they need in carrying out these important war undertakings, and I want to thank them for the enthusiasm they are displaying.

Now a word generally about prices. In all cases satisfactory minimums have been fixed so that growers will know where they are. In the unlikely contingency of surpluses occurring in some forms of production they will be taken care of on a basis that will be mutually arranged. There will be difficulties—fertiliser is in very short supply because the islands we

are accustomed to receive most of it from are temporarily in the hands of the enemy. But we can get through with what we have if we use it economically and to the best advantage. Many will be disappointed at not getting more, but I would ask them to realise that national interests come first, and that the Government must take the responsibility of deciding where that can be best served, and to put up with the temporary sacrifice with resolution, knowing that they are making a contribution to the National cause.

In that cause I make this appeal.

Women Join In

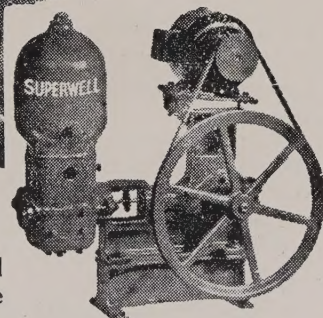
It is encouraging to see the response that is already being made. The women and children are joining in. For example, the Woodville Branch of the Women's Division of the Farmers' Union have pledged themselves to join the Pahiatua crusade to save shipping space by growing potatoes and vegetables and producing more eggs to be worthy of our fighting services, and the Pahiatua Scouts and Cubs have pledged themselves to join with any efforts to produce extra produce. We can only succeed in it if we have the combined good will of our farmers.



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from north to south. I ask them to tackle this as a great war effort, and, like the fighting forces, we are doing it for, not to spare themselves in the effort.

There will be difficulties as I have said. Labour is one of them. But we have taken steps in combination

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with the Army to overcome as far as possible even that difficulty. Under the arrangement that has been made, appeal boards will act on the recommendations of District Primary Production Councils, and essential men will be quickly released from their units and returned to the farms where, if there is necessary work for them to do, they will be permitted to remain—again on the recommendation of the Production Councils.

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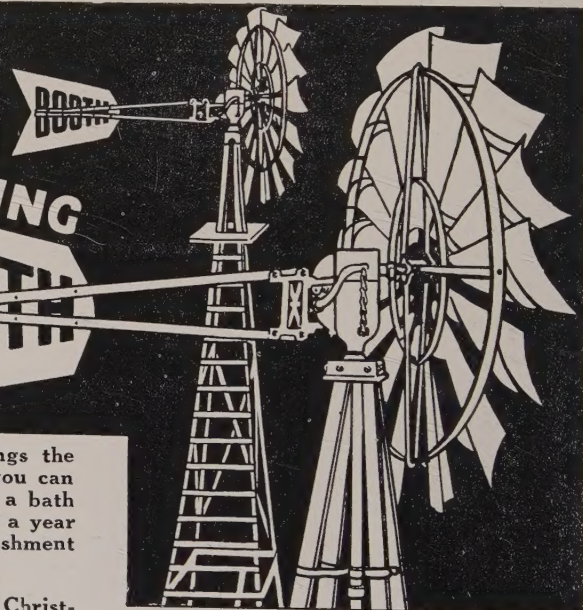
I need not say how important it is that no man is applied for who is not essential or how rigidly the Production Councils must enforce the principle of essentiality if they are to retain the confidence of the Army and the Government. I am glad to say that in practically every instance the councils are fully representative of the farming community and alive to the great responsibilities that have been imposed upon them.

They are the officers in a production army, whose intelligence staff is the Department and their task is to so dispose their force of loyal and earnest farmers that the best that can be done will be done on our production front.

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BRANCHES THROUGHOUT NEW ZEALAND



The Blue Lupin Crop in Mid-Canterbury

DURING the past two years the Ordinary Blue lupin (*Lupinus angustifolius*) has spread most markedly throughout the Ashburton County and is now to be found growing in almost all districts from the sea to the foothills. Of the one million acres of flat land in the Ashburton County more than three-quarters of a million acres can be classed as medium to light land, and it is chiefly on this type of country that lupins are grown most extensively. Their use, however, is gradually spreading to the heavy land as well. Some six or seven years

ago lupins were grown to a very limited extent indeed; today, they are a common crop on many Ashburton farms.

Reasons for Popularity

Why have blue lupins become so popular in recent years in Mid-Canterbury? The reasons are many; but the following are perhaps the most important ones. In the first place farmers have now a better appreciation of the habits and growth characteristics of the plant. Lupins, unlike turnips and other forage crops, possess certain limitations and these must be understood by the farmer if success is to be achieved with the crop. In the past failures were common. Heavy frosts destroyed the feeding value of

crops, sheep losses in some instances were abnormally high, and difficulties were often experienced in harvesting the crop.

Mainly because farmers have been quick to take advantage of successful methods practised by others in various localities, these problems have now

By

G. K. McPHERSON,
Instructor in
Agriculture,
Ashburton.

been largely overcome. Sowing at the correct time for the district has eliminated the number of crops ruined as a result of frosts. It is probably also true that as a result of experience gained in the feeding of the crop at different stages, sheep losses are now no higher than with other forage crops. In addition the header harvester has solved most of the difficulties associated with the harvesting of the crop.



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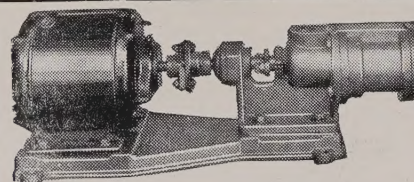
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Sheep feeding off a crop of Blue Lupins. Note the fresh break of lupins in the background.

Additional Feed Crop

The uncertainty of the turnip crop, particularly on the medium and lighter class of land has tended to make Blue lupins more popular. Lupins will thrive under relatively dry conditions, conditions under which turnips may receive a setback and become subject to white butterfly and diamond back moth attack. It is not suggested that lupins should replace turnips, but merely that under unfavourable weather conditions lupins can success-

fully augment the supply of autumn, winter, and spring sheep feed.

Last autumn affords a good example of this. Turnip crops, in some localities, were adversely affected by the low rainfall, and there is no doubt that those farmers possessing an area of lupins, have a much easier mind as far as their supply of winter sheep feed is concerned.

Lupins Maintain Soil Fertility

Perhaps the most important reason, however, for the trend towards a

greater acreage of lupins lies in the fact that the Ashburton County is the largest wheat-producing area in the Dominion. Mid-Canterbury probably possesses some of the finest wheat-growing land in New Zealand; but it has to be remembered also that a very considerable proportion of Mid-Canterbury's wheat is grown on light to medium land which normally produces less than 30 bushels per acre.

It is generally recognised that wheat is an exhausting crop on soil fertility, and this factor is evident on the lighter classes of soil in their inability to grow clovers or hold pastures for any length of time. It is under such conditions that lupins have proved most valuable and are most widely grown.

Farmers in the Pendarves, Chertsey, Mitcham and Lauriston districts, and on the lighter class of country between the Ashburton and the Rangitata rivers are perhaps the most consistent growers of lupins in the county. Here the lupins

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prove most valuable in replacing humus and nitrogen and thereby assisting to maintain the soil fertility lost in the production of the wheat crop. The fertility is restored either by feeding off the lupins or by ploughing the green crop under. The latter method appears to be gaining in popularity. The lupins may be grown before or after the wheat crop, depending on how best it fits in with the farmer's rotation.

During the past twelve months another factor has arisen which undoubtedly has stimulated the growing of the lupin crop and that is the rationing of fertilisers. With the present restricted use of artificial fertilisers and the prospects that the restrictions may continue during the period of the war, it is anticipated that lupins will be even more widely grown than they have been in the past, as they appear to be the only crop of economic importance which will provide good sheep feed and at the same time assist materially in the maintenance of soil fertility.

Successful in Mid-Canterbury

The acreage of Blue lupins now grown would indicate that they have proved a success on the light and medium soil types of Mid-Canterbury. Whilst they cannot be classed as a fattening crop in the same way as rape and turnips, it is generally agreed that sheep grazing on lupins will actually improve in condition. As a soil fertility builder Blue lupins would also seem to have proved their worth. Lupins grow reasonably well without fertiliser, and once established on a farm an ample supply of cheap seed is usually assured.

Cases are known where sheep, foreign to lupins have taken to them quite readily; but to a farmer growing them for the first time a relatively small area is recommended. Too much reliance should not be placed on them for feed purposes until the sheep have become accustomed to them.



Fig. 1.—Ploughing in a crop of Blue Lupins. To ensure lupins being completely covered, chains are attached to the plough.

[R. Inch, Photograph.]

Practical Experience

In the February, 1940, issue of this "Journal" there appears a comprehensive article describing the experiences of a Mid-Canterbury farmer with the

Blue lupin crop and the success he attained with it both as a forage crop and a soil fertility builder. The article dealt in detail with the methods of sowing and utilisation of the crop practised by Mr. W. H. Wilkinson on



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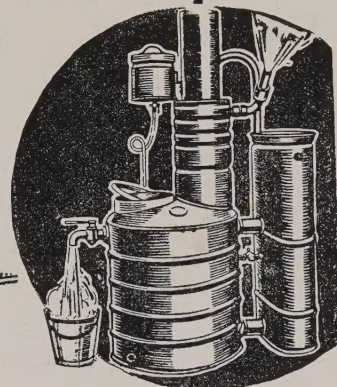


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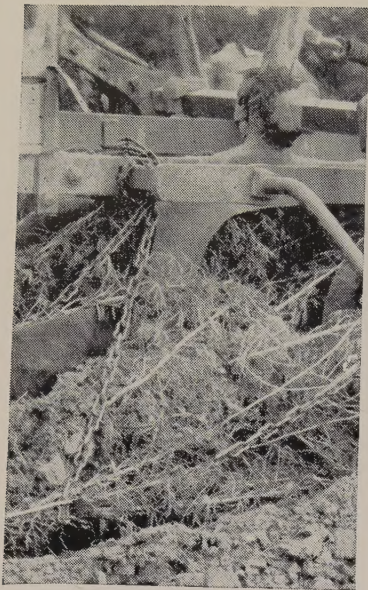


Fig. 2.—A close-up view showing method of attaching chains to the plough in Fig. 1.

[R. Inch, Photograph.]

his farm at Chertsey, and it may not be out of place to summarise the procedure adopted with this crop on his property.

Mr. Wilkinson makes provision for spring feed by sowing lupins and grass in March or April after a cereal, whilst for seed production alone the lupins are sown by themselves in March. Autumn feed, April, May, June period, is secured by sowing the lupins in December and January. Whenever harvesting of the crop is carried out a second crop is usually obtained from the reseeded.

Time of Sowing

The all-important point in lupin growing appears to be **time of sowing**, and this will vary depending on the climatic conditions and the purpose for which the lupins are required. To obtain satisfactory results nearer the hills where the frosts are more severe it would seem that sowings for late winter and early spring feed should take place not later than the end of February, whilst for winter feed a late December or early January sowing may be most suitable. In those areas where lupins are not widely grown, however, it is advisable for the

farmers to sow them in breaks, in order to arrive at the most opportune time of sowing for the locality.

The Sweet Blue lupin has not been grown in Mid-Canterbury, but experience elsewhere suggests that sheep will take to this variety far more readily than to the Ordinary Blue lupin. The methods of establishment and management of the two varieties are similar.

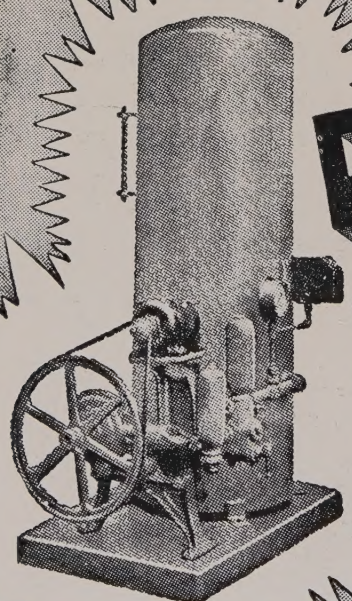
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VACCINATION

Against Contagious Abortion

—By—
J. F. FILMER,
Director, Animal Research Division, Wellington.

ABORTION of dairy cows is one of the major problems affecting production in every dairying country. Figures taken from the last annual report of the New Zealand Dairy Board show that approximately 5 per cent. of all dairy cows in New Zealand abort each year.

Abortion is most prevalent in young cows, the incidence in two, three, and four-year-old cows being 10 per cent., 7 per cent., and 4 per cent., respectively, while in older cows it is generally between 2 per cent. and 3 per cent. In the season following abortion, cows on the average produce approximately 120 lbs. less butterfat than in a normal lactation, and over 14 per cent. of them fail to conceive. In some herds the position is, of course, much worse than that indicated by the above figures; 10 per cent. to 15 per cent. of abortions is not uncommon, and in one herd of 74 cows, 26 (35 per cent.) aborted.

On the above basis, it may be calculated that the annual loss to New Zealand from abortion is approximately 12,000,000 lbs. of butterfat, valued at £800,000, while the loss to an individual dairy-farmer in which 15 out of 100 cows abort would be just over 2000 lbs. butterfat valued at approximately £135.

Germ Infection

While a variety of causes such as accidents, poisons, faulty nutrition, and infections other than the abortion bacillus may precipitate abortion, it is generally agreed that more than half

of the total number of abortions is due to contagious abortion caused by infection with a specific germ known as *Brucella abortus* and that when the percentage of abortions in a herd increases above that usually experienced, the increase in the vast majority of cases is due to this infection. In addition to causing abortion and sterility, this organism frequently lodges in the udder, and drinking the infected milk may produce a fairly serious disease in

human beings known as undulant fever. The udder infection is also held by some to predispose towards mastitis.

Very extensive research has been conducted all over the world with a view to discovering a means of controlling contagious abortion. The first major advance was the discovery of the causal organism by Bang and Stri-bolt in Denmark in 1896. This organism is present in large numbers in the aborted calf, the after-birth, and the discharges from the cow, and these are the worst offenders in spreading the disease. Following the discovery of a blood-test for infection with the



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abortion bacillus, it was found, however, that cows which do not abort may be infected and are capable of spreading the disease.

Attempts at control have been along three main lines:

1. Treatment with drugs.
2. Segregation or slaughter of infected animals.
3. Vaccination.

Treatment With Drugs

Very many drugs have been tried and experiments are still continuing. Promising results have been reported from time to time, but further tests

have failed to confirm them. A number of quack remedies have appeared, two of the most popular in America being composed mainly of starch and sugar. Though the future may produce a drug, which will prove effective in the treatment of contagious abortion, it can be asserted definitely that no drug of proven efficacy is available today.

Segregation of Infected Animals

In any infectious disease, segregation is obviously a wise procedure, and it should be practised in contagious

abortion as far as possible. Aborting cows should be removed from the herd until the discharges have ceased and the aborted calf, though after-birth, and the discharge should be destroyed, preferably by burning.

Pregnant heifers should not graze with the main herd nor should dry cows run with the heifers. Heifers are particularly susceptible to infection from three to six months after conception and therefore care should be taken to protect them during that period.

Slaughter of Infected Animals

Unfortunately, these precautions though well worth while can never eliminate contagious abortion since many infected cows can be detected only by a blood-test. This knowledge led to eradication methods based on the segregation or slaughter of all reactors. A test and segregate method gives good results only under extremely favourable conditions which would seldom be available on New Zealand dairy farms.

The test and slaughter method has been widely practised overseas and in some places has given very good results. It is, however, very costly, as it involves the ruthless slaughter of many valuable animals, and it requires scrupulous care in protecting the herd against all possible means of infection. As other animals, such as pigs, horses, dogs, poultry, birds, and men may carry the infection, and clean herds develop no immunity the risk of reinfection is always present.

Vaccination

It was early noticed that infected cows, after aborting once or twice, frequently calved normally thereafter, even though abortions continued to occur in heifers or newly-introduced cows in the same herd. It therefore seemed likely that infection was followed by some immunity, and this led to attempts to protect cows against abortion by vaccination.

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Since 1902 experiments with vaccines have been going on almost continuously. Vaccines made from dead cultures have met with very little success. Live vaccines made from virulent cultures have frequently been successful in lowering the incidence of abortion, but they have obvious disadvantages. Animals vaccinated with such cultures, though they may not abort, are capable of spreading the disease to other cows, and their milk may contain the organism and cause undulant fever. It was also found that they were sometimes hard to get in calf.

Recently, attention has been mainly directed to live vaccines made from cultures of strains of abortion bacilli in which the virulence has been reduced. These have none of the disadvantages of the earlier live vaccines, and some of them have been very successful in reducing the incidence of abortion.

The vaccine which has been most widely tried is made from an American strain of reduced virulence known as Strain 19. Small-scale experiments commenced with this strain in America in 1925, and these were followed by extensive field trials extending from 1936 to 1940. As a result of these tests the United States Bureau of Animal Industry last year adopted calf-hood vaccination with Strain 19 vaccine as part of its official programme for the control of contagious abortion. This vaccine is now also being used in England.

In order to give some idea of the protection offered by this vaccine, some results obtained in American trials are quoted hereunder.

Early Small-scale Experiments

In these, a total of 70 heifer calves were vaccinated between the ages of four and eight months, and these, together with 73 unvaccinated heifers were severely exposed to infection during their first pregnancy. Eight vaccinated animals became infected and one of these aborted, while 57 of the unvaccinated animals became infected and 55 aborted.

Field Trial 1

Seventeen thousand heifer calves in 260 herds were vaccinated between the ages of five and seven months in a trial extending over five years. When the results were reported, these heifers had dropped 8182 calves, of which 5673 were born from the first, 2026 from the second, and 483 from the third pregnancies. Seven thousand eight hundred and seventy-two (96.2 per cent.) of the calvings were normal; 310 (3.8 per cent.) abortions occurred, 128 (1.6 per cent.) of the abortions were due to contagious abortion. At the commencement of the trial, 29.2 per cent. of the cows in the herds gave positive reactions and 8.4 per cent. gave suspicious reactions to the blood test for contagious abortion and a number of these reacting cows aborted during the experiment.

In order to make the test a severe one, no attempt was made to segregate the vaccinated heifers, the usual sanitary practices were not applied and the only means resorted to in an effort to control and eradicate the disease was calf-hood vaccination.

Field Trial 2

Seven hundred and ninety-six heifers in eleven herds were vaccinated at

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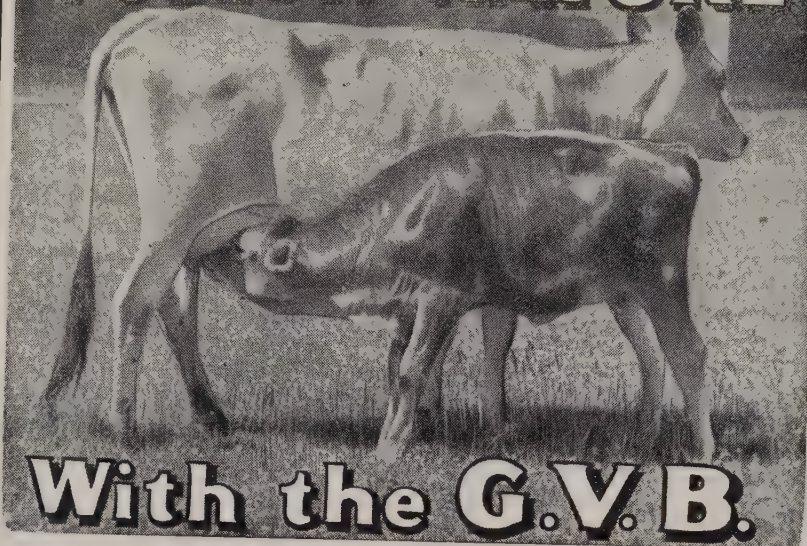
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J.A. 15/8/42

ages between three and twenty-one months in trial extending over five years. At the time of reporting, 640 calvings had occurred, 172 of the vaccinated heifers having had one calf, 90 having had two calves, 4 having had three calves, 1 having had four calves, and eight having had five calves. Ten (1.5 per cent.) abortions occurred in the vaccinated heifers, and of these five were due to contagious abortion.

All the cows in these herds were blood tested, but owners were encouraged to keep reactors as long as they remained profitable or until vaccinated replacements became available. At the commencement of the trials, there were 596 milking cows in the herds, and there was an average of 36.2 per cent. reactors in the incidence in individual herds varying from 6.5 per cent. to 100 per cent.

At the time of reporting the total number of milking cows had increased to 686, and the percentage of reactors varied from 0 per cent. to 13 per cent., with an average of 8 per cent. There were then 334 vaccinated animals in the herd, and only four (1.1 per cent.) of these were reactors.

Field Trial 3

In this trial which extended over six years, 1956 animals in 17 herds, most of which were heavily infected, were vaccinated. At vaccination, 949 animals were between four and eight months, 508 were between eight and sixteen months, and 499 were over sixteen months.

At the time of reporting, 1956 vaccinated cows had calved once, 629 twice, 216 three times, 58 four times, 11 five times, and 2 six times. Out of this total, of 2873 calvings, there were 5.9 per cent. abortions or stillbirths, while out of 1763 calvings or unvaccinated cows in infected herds, there were 13.9 per cent. abortions or stillbirths. In a series of herds which were kept free or relatively free from contagious abortion by frequent blood tests and removal of reactors, and in which vaccination was

not practised, 8860 calvings were recorded and in these there were 6.4 per cent. of abortions and stillbirths.

Vaccination— A Preventative

It will be noted that in the first of these trials the vaccination was confined to calves between the ages of five and seven months, in the second trial yearlings as well as calves were vaccinated, while in the third trial some cows were vaccinated as well as yearlings and calves. This may perhaps lead to some confusion.

At present, only the vaccination of calves between four and eight months is officially recommended by the United States Bureau of Animal Industry. This is probably due to the fact that when calves are vaccinated at this age, the blood reaction set up by the vaccination generally disappears before the animal calves, but when vaccinated at a later date the reaction lasts much longer. This is, of course, important where schemes for certifying herds free from contagious abortion are in operation, as such certification is based on freedom from reactors to the blood test. Hence, where vaccination is confined to calves, it can be combined with a certification scheme and herds can be built up which are free from disease and, at the same time resistant to infection.

In badly infected herds, however, it was thought by some workers that by extending the vaccination to yearlings and cows, the disease could be controlled more rapidly, though in these too, after the first year, vaccination would be confined to calves. The results in field trials 2 and 3 appear to support this contention.

It must be clearly understood, however, that vaccination is a preventative, not a cure, thus it is useless to vaccinate cows which are already infected. In these the infection if acquired when the cow is empty, frequently results in immunity thus accounting for the large percentage of infected cows which do not abort. If

the infection occurs during pregnancy, the cow generally aborts. If extensive damage to the uterus occurs it either becomes sterile or aborts in subsequent pregnancies; while if the uterine damage is relatively slight, recovery takes place and the cow becomes immune. Further, the vaccination of cows should only be done when they are empty and preferably at least three weeks before mating.

Progress in New Zealand

Strain 19 was imported into New Zealand from America in 1941 and in

that year a small number of calves in the experimental herds in the Department of Agriculture were vaccinated. This year, through the collaboration of a number of dairy-farmers, it was possible to vaccinate approximately 400 calves. The results of these vaccinations will, of course, not be available for several years, but they have enabled the staff to gain experience in preparing the vaccine for use under field conditions.

It is felt that the time has now arrived when the results reported from America justify the extensive use of

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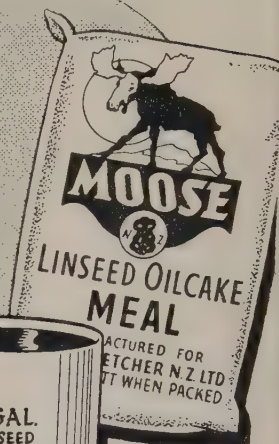
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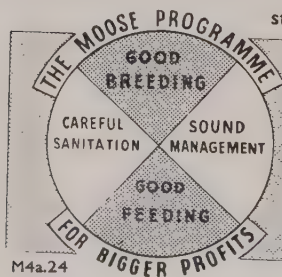
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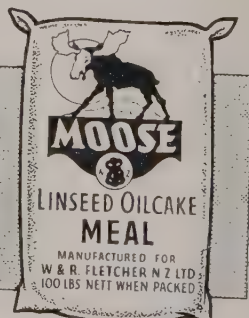
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vaccination with Strain 19 in New Zealand and our experience during the last two years makes us feel competent to prepare and supply vaccine for this purpose.

Arrangements have already been made to vaccinate yearlings and non-reacting cows in some badly affected herds. It is unfortunately now too late in the season to extend such vaccination further this year. The Department is, however, prepared to vaccinate a large number of this season's calves. It must be clearly understood that vaccination will not entirely eliminate abortion in the vaccinated animals. It can have no effect whatever on abortion other than contagious abortion and the American results indicate that though it greatly reduces the incidence of contagious abortion, it will not completely eliminate it in all herds. It is hoped, however, that the extensive use of vaccine will significantly reduce the present incidence of abortion in New Zealand and will prevent the large outbreaks of contagious abortion which prove so calamitous in some herds.

The preparation of the vaccine will be undertaken at the Wallaceville Animal Research Station and vaccination of calves will be conducted by the veterinarians and stock inspectors of the Livestock Division. The calves will be vaccinated between the ages of four and eight months and it is anticipated that the majority of the work will be done in January and February. No charge will be made.

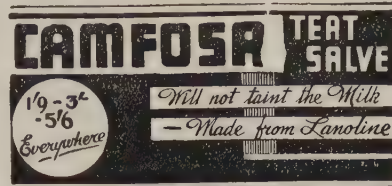
Application For Vaccine Service

Those who desire to have this season's calves vaccinated should fill in the form which is printed on this page and post it to the Director, Animal Research Division, Department of Agriculture, Wellington, to reach him not later than October 31, 1942. Should more applications be received than can be handled, preference will be given to

those herds in which contagious abortion is causing most trouble.

All calves vaccinated must be identified individually either by ear tattoo or by some other satisfactory system so that in the event of abortion, the fact and time of vaccination can be established. Dairy farmers whose calves are vaccinated will be asked to supply annually, details of abortions occurring in their herds and in future years will be asked to report abortions in their vaccinated animals as they occur and to supply samples from aborted calves for bacteriological examination. Where possible, blood

samples will be collected from vaccinated animals which abort so that it can be determined if the abortion is due to the contagious abortion bacillus.



Application for Vaccination of Calves Against Contagious Abortion

Name of Owner

Address

Cows in herds: 2 year olds..... 3 years and over.....

Yearling heifers:

Heifer calves born in 1942:

*(a) Bred on farm.....

*(b) Outside purchase

Number of cases of abortion:

1941 2 year olds..... 3 years and over.....

1942 2 year olds..... 3 years and over.....

Note: An abortion is defined as any calf born under 8 months which failed to live. Abortions should be recorded for the year in which the cow would normally have calved.

I hereby apply for vaccination of my heifer calves as shown above and agree to provide annually details of abortions occurring in my herd and to report promptly abortions which occur in vaccinated animals and, where possible, to supply specimens of calves aborted by vaccinated animals.

Signed Date.....

* Give individual numbers or other identification marks, and dates of birth on a separate sheet.

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WHY NOT SPIN

(Continued.)

YOUR OWN WOOL?

Drafting

Before describing the actual procedure in spinning, it is advisable to explain at this stage the mechanism of drafting, on which successful spinning largely depends. In Fig. 14a is illustrated a short length of yarn in which there is a noticeably thick place or "slub." It will be noticed that the thinner parts of the yarn are fairly closely twisted, whereas the thick part has very little twist. The close twist of the thinner portions renders them relatively stronger than the loosely-twisted thick portion, so that where this length of yarn is subjected to tension it stretches, mainly at the thick region, by one fibre slipping over another. As the thick portion is reduced in diameter some of the twist from the adjacent portions passes into it and tends to tighten it up, thus reducing the amount of twist, and to some extent the strength, of the thinner portions. (See Fig. 14b). If this process went too far the yarn would be likely to break if tension were still applied, but in practice the twist in the thinner portions is being replaced by the rotating spindle of the spinning machine, so that further tension can safely be applied to cause further slipping, reduction of diameter, and twisting of the thick portion, until finally it closely resembles the rest of the yarn in both thickness and degree of twist (See Fig. 14c). The yarn will now be sufficiently tightly twisted to prevent further fibre slippage, so that the only result of applying greater tension will be to cause it to snap.

This principle of drawing out the yarn to even it up and get rid of thick places is known as "drafting," and it

—By—

J. E. DUNCAN,
Wool Supervisor,
Livestock Division,
Wellington.

is indeed fortunate that this characteristic reaction invariably takes place, for without it the difficulty of producing anything like an even yarn by hand would be very great.

Spinning

To start spinning for the first time, proceed as follows:—

1. Place an empty bobbin on the spindle and tie tightly to this bobbin the end of an eighteen-inch length of wool or string.

2. Then take this string up over the nearest hook on the flyer and thread it out through the hollow end of the spindle. This is most easily accomplished by pushing up inside the hole in the spindle a hairpin, or similar bent bit of wire, until it can be seen from the "eye" or hole in the side. It is then easy to push the string through both "eye" and hairpin, and draw it out by means of the latter.

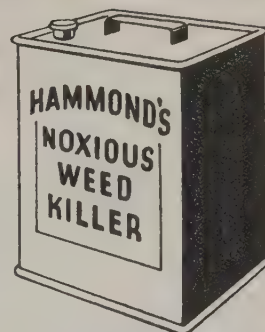
3. Now see that the brake-band is properly in position in the groove in the bobbin and that there is some tension on it.

4. Hold the rolag near one end in the right hand and lay the end of the piece of string, or wool, along it for an inch or two. Now start to treadle, slowly at first.

5. It will be found that the end of the string will start to revolve too, and if it has been laid correctly it will immediately entangle and pick up some of the loose fibres of wool in the end

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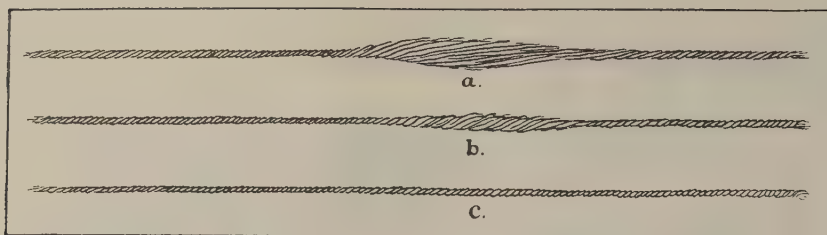


Fig. 14.—Drafting, to reduce thick place in yarn.

of the rolag. If correct tension has been applied to the brake-band there will also be a tendency for the string to be drawn in through the hollow spindle.

6. This is the time to speed up the rate of treading, and at the same time assist the string in its movement towards the spindle by pulling it in

that direction with the finger and thumb of the left hand against the tension of the wool, to which it is now attached. At the same time that this is happening the finger and thumb of the right hand should be grasping the rolag an inch or so from the end and drawing it away in the opposite direction. The combined

operation will have the effect of drawing out from the end of the rolag the small wisp of fibres which has become entangled in the end of the string.

7. The left thumb and forefinger are now momentarily released from the string and the right hand is brought towards the spindle. Two things should now happen simultaneously; the string should be drawn through the spindle and wound on to the bobbin, and the twist should run up the wisp of wool fibres towards the rolag. If all has gone well up to this stage, continuous spinning should follow on without difficulty.

8. The spun yarn is again grasped between finger and thumb of left hand at a comfortable distance from the spindle (usually 6-12 inches). (This distance will vary according to the length of the spinner's arm, where he is sitting, and other factors, but the main thing is that the spinner should assume a comfortable attitude, as any other will soon be tiring.) While the yarn is thus momentarily held the right hand should be drawn steadily backwards for two or three inches allowing a further loose wisp of fibres to be drawn out from the rolag. To begin with, the length that can be drawn out at a time will be small but as skill and confidence increase, so also will the length which can be safely drawn out each time. Fig. 15 shows this stage.

9. If the wisp of fibres is drawn out too far it will simply part company with the rolag, but before this stage is reached the left finger and thumb are momentarily released, thus allowing the twist to run up and strengthen the wisp or "sliver" of fibres. As this happens the right hand is again moved towards the spindle, thus allowing the spun yarn to be drawn in and wound on the bobbin. (See Fig. 16.)

10. As the right hand reaches the end of its stroke the left once more grasps the yarn and the right is again moved away, thus pulling out a fresh wisp of sliver of fibres. The left is again re-

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leased, allowing the twist to run up, and so process is repeated each time.

11. It is very important to see that the twist does not run up past the right forefinger and thumb into the rolag itself, or the spinner will find himself in difficulties immediately. Actually there should always be a short length of fibres, about an inch, practically free of twist, immediately in front of the right finger and thumb. It is from this length of untwisted fibres that the sliver is drawn out. Were these fibres already tightly twisted it would be difficult or impossible to draw them out at all. It is the main function of the left hand to control the rate at which the twist runs up the sliver, letting the twist pass the finger and thumb enough to make the yarn hold together, but not so much as to prevent drafting or drawing out of the sliver. As spinning progresses the rolag is progressively fed forward through the hand to keep up the supply of untwisted fibres. When the bobbin begins to fill up in one place the yarn is moved along on to the next hook on the flyer, so that the bobbin is filled up by stages.

12. The importance of having the correct amount of tension on the bobbin brake-band can now better be explained. If the tension is too great the bobbin will be unduly retarded and the effect

will be that the yarn is drawn in too forcibly before it has had time to receive sufficient twist, thus giving a weak and soft-twisted yarn. What usually happens in practice is that the yarn is pulled away from the spinner's grasp and snaps before he can control it.

Conversely, too little tension on the brake-band will mean that the yarn is hardly drawn in at all and is badly over-twisted. This will cause it to be very hard and full of kinks. Only practice will indicate just the correct amount of tension.

Breaks in the yarn are easily mended by fraying out the broken end of the yarn and also the end of the rolag, and overlapping these portions an inch or two. The twist will run up into this portion and firmly join it. An expert can repair a break in an instant without even slackening the speed of

treadingling, and so neatly that the join will be undetectable.

At best, spinning is a difficult process to describe on paper, a practical demonstration from someone already versed in the art being far the best.



Fig. 15.—Drafting yarn by drawing back the right hand holding the rolag.



Fig. 16.—Feeding the spun yarn forward through the spindle.



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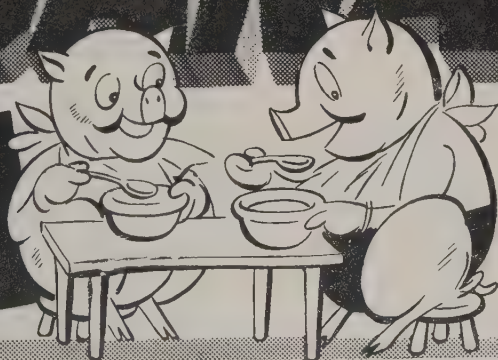
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way to learn. The foregoing notes are given only in the hope that they will be of assistance to those not fortunate enough to receive direct tuition.

Plying Wool

The thickness of the yarn spun can be varied a good deal according to the wishes of the spinner, but even if thick enough, the single ply yarn which is spun is not suitable for knitting. To make it so, it is necessary to twist two or more strands together. This is easily done, as follows:—

For example, to make two-ply wool two full bobbins of single ply yarn are placed on the bobbin holder or "Lazy-Kate," as it is called. The ends of these yarns are tied to the "leader" (the short length of wool usually left on a bobbin to facilitate starting), so that they are twisted together and wound on to the bobbin as a two-ply yarn. (See Fig. 17.) Two points in the procedure differ, however, from ordinary spinning. Firstly, the tension on the brake-band is considerably increased, so that the two-ply yarn will wind on to the bobbin without assistance, the two strands merely passing



Fig. 17.—Two-plying.

between the fingers as a guide. Secondly, the direction of rotation must be reversed. This is done simply by treading the wheel in the opposite direction, but in the case where an electric sewing-machine is used and the motor cannot be reversed, the same effect can be obtained by crossing the belt. By plying white and a coloured strand pleasing marl effects can be obtained.

Skeining

The next stage is to place the full bobbin of 2-ply wool on the Lazy-Kate and wind it off on to the skeiner. (See Fig. 18.) It will be noticed that it is wound on to the skeiner with an over-and-under motion, so that while the skeiner itself is eighteen inches long the skein when removed measures 36 inches, when stretched over the fingers. Before it is removed from the skeiner, however, the skein of wool should be tied in four places with string to prevent it tangling when being washed.

Washing

Thorough washing is necessary to remove the natural grease, and any oil which may have been added. The skeins should be washed in water at about 120 deg. F. (as hot as the hand can bear), to which has been added good laundry

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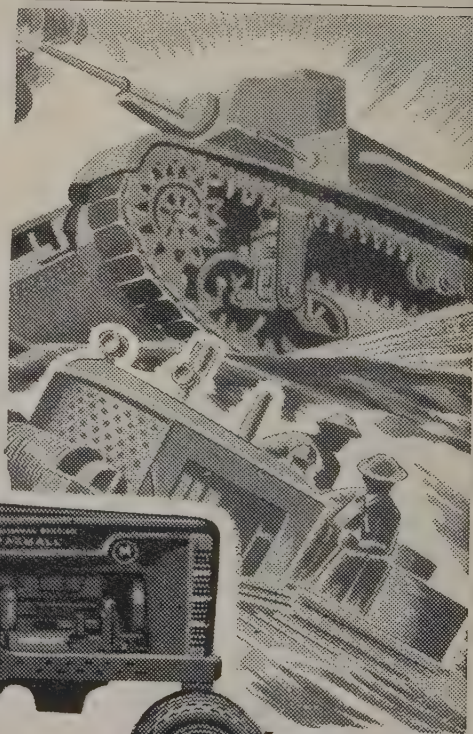
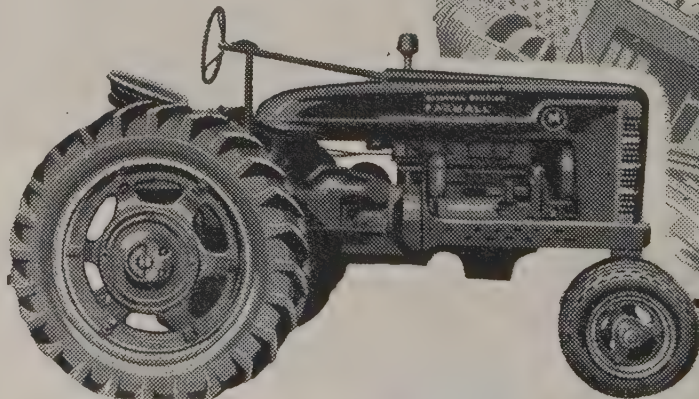
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soap. Do not rub or agitate unduly, but rather squeeze gently in the hands to avoid tangling and felting. If the wool is very dirty it may need a second wash with more soap before it is rinsed in plenty of warm water, and then hung in the sun and wind to dry.

Bleaching

At this stage the wool may be quite white enough and ready for use, but some varieties of wool may show a creamy or yellowish tinge which is not desired, and must be bleached. This can be done either with the wool in the skein or after it has been knitted up. The procedure is simple. Have the wool damp (after washing) and hang the skein or garment inside a fairly large packing-case, which is turned open side down, so that the wool is hanging from the bottom. Place some glowing wood embers in an old tin and put this on the ground inside the case, sprinkling over the embers about a heaped teaspoonful of sulphur. Lower the case on to the ground again, leaving just a small opening at the bottom, enough to admit a little air, and make sure the sulphur is all burnt. Leave the wool exposed to the sulphur fumes for half a day, and by that time it should be thoroughly bleached. This process may be repeated at any later date if the article shows signs of yellowing again. Some wools, such as Merino, are naturally white and will never require this treatment.

Dyeing

The easiest way to accomplish this is to take the knitted garment to one of the commercial dyeing and cleaning firms to have it dyed; and most of the packet dyes on sale are also fairly reliable and easy to use, but quite apart from the cost involved in this procedure it is likely that anyone sufficiently interested to do their own spinning would also like to try dyeing with one of the vegetable



Fig. 18.—Winding from bobbin on to skeiner.

dyes, which are procurable from many homely sources and have a fascination all their own.

Dyeing may be done at practically any stage. For instance, the loose wool may be dyed before spinning, the yarn may be dyed in the skein, or the finished garment itself may be dyed. Each method has points both for and against it.

Dyeing the loose wool means a good deal of extra work, as the wool has first to be thoroughly washed or scoured before dyeing, and then well oiled

again afterwards before it can be spun, but for certain things such as the making of a "heather-mixture" yarn this extra work is inevitable, as the speckled effect in the yarn is obtained by thoroughly carding together two or more colours of wool before spinning. Dyeing the loose wool will also give the most even shades where only one colour is used, for any irregularities of shade will be levelled out in the carding process which thoroughly mixes and blends the wool.

Commercial dyers are generally reluctant to dye wool in the skein because it is more difficult to get the colour absolutely even, and any irregularities in shade are apt to be rather conspicuous when the wool is knitted up. However, for home-dyeing with vegetable dyes and where reasonable care is taken, this method is generally



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quite satisfactory and has the advantage that enough wool for quite a lot of knitting can be dyed at once.

The third method of dyeing the actual garment has the advantage that irregularities in shade are not so obvious, as they vary gradually from one part of the garment to another and not abruptly as where the irregularity lies in the yarn itself.

Vegetable Dyes

As a class, vegetable dyes produce shades which are reasonably fast to light, but their main attraction lies in the range of soft, mellow tonings which may be produced by their use, and which cannot easily be duplicated by the use of the coal-tar dye-stuffs, which tend to give brighter but "harder" colours. Furthermore, if vegetable-dyed materials do fade the new tones are nearly always still pleasing to the eye, which is more than can be said for some of the aniline dyes. Another advantage is the ready availability of many of the materials and the endless different shades which may be produced by varying the conditions under which they are used.

It is desirable for this reason to make notes when dyeing about the source of the material, the time of year when it was gathered, and the exact conditions under which it was used, so that this information will be available later on if it is desired to reproduce the same shade again.

Mordants

With few exceptions most of the vegetable dyes will not colour wool directly by themselves, but require a third substance, or "mordant," to act as a link binding the dye to the wool fibre. Fortunately, most of these mordants are well-known chemical substances which are generally readily procurable. The ones commonly used in vegetable-dyeing of wool are:—

1. Alum (Potassium aluminium sulphate):— This is the most widely-used mor-

dant for wool. Use in the proportion of 3-4 ounces of alum to each 1lb of dry clean scoured wool — the smaller quantity for fine wool or light shades, the larger for coarser wool and/or darker shades. The alum is dissolved in sufficient water to hold the wool comfortably. Too much water means waste of time and fuel in heating—too little means the wool is too tightly packed and uneven dyeing results. This applies to all mordants.

When the alum is dissolved and the solution is warm, put in the damp wool (i.e., it will still be damp after washing out the oil), and bring **gradually** to the boil and simmer gently, keeping it just boiling for 30 minutes. Allow solution and wool to cool, and then gently wring out the wool and place it in linen or cotton bags (old salt or flour bags) in a dark place for 2-3 days before dyeing. This allows the alum to thoroughly impregnate the fibre and is the best method. If this cannot be done and dyeing has to follow immediately, the wool will have to be boiled for 45 minutes with the alum—but the first method gives the best results. Too much alum makes the wool sticky.

2. Bichromate of Potash:—

This is another very useful mordant, used in the proportion of a quarter of an ounce to one pound of wool. Use in the same way as for alum, but boil for 45 minutes. Dyeing may follow immediately. Keep lid on pot to exclude light, which affects this mordant.

3. Iron Sulphate (Copperas: Green Vitriol):—

Use a quarter of an ounce to each one pound of wool and boil for thirty minutes. Don't prolong the boiling or exceed the the above quantity, or the handle of the wool will be impaired, and the colours unduly darkened.

4. Tin Crystals (Stannous Chloride):—Use a quarter of an ounce to each one pound of wool. Enter the damp wool into the **cold** solution and boil for one hour. Nearly always used in conjunction with

cream of tartar, but may be used as a modifying agent with other mordants to brighten colours. Too much makes wool harsh and brittle.

5. Cream of Tartar (Argol):—This is not strictly a mordant as it is not used by itself but as a modifying agent with other mordants—generally to brighten colours. It must be used carefully and a record kept of the exact proportions used if the shade has to be duplicated later. Usually about one ounce to the 1lb of wool is used.

General Hints on Mordanting

(a) Have wool perfectly clean and free from all grease or soap.

(b) See that all the mordant is dissolved before entering wool.

(c) Make sure that skeins are properly tied, but not too tightly or dye won't penetrate at those points, resulting in light patches.

(d) Enter the wool damp to get even penetration and results.

(e) Stir only enough to get even penetration—too much agitation will lead to felting of the wool.

(f) Have pot large enough to hold wool comfortably and keep lid on to exclude light.

(g) Although mordanting is generally done before dyeing the two processes may be done together in the same pot, which generally gives brighter colours which are not so fast to light. Where great fastness is required the wool may be mordanted, dyed, and mordanted a second time, although this is inclined to make it rather harsh.

A single dye may give totally different colours when used with differ-

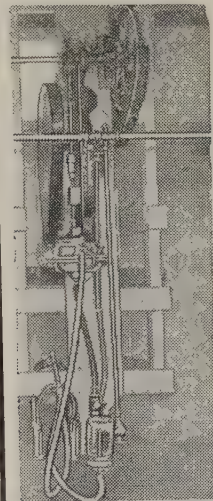
ent mordants, e.g., cochineal with iron sulphate gives a purple shade. When cream of tartar is added to the iron sulphate the colour becomes grey, and the further addition of tin crystals changes it to red. It is worth while experimenting with the various mordants, and a small quantity of wool in testing any new dye for the first time.

Equipment

This is very simple, consisting of enamel or galvanised iron vessels fitted with lids, wooden (or better still glass) rods for stirring, and a few muslin or cotton bags to hold some of the

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vegetable materials and keep them from being entangled in the wool. Rubber gloves are useful.

Method of Dyeing

The dye may be extracted from material such as roots or bark by first pulverising and then boiling in water for an hour or more, the strained liquor being used to dye the wool. In this case the wool is put into the boiling liquor. Alternatively, materials such as lichens can be placed in bags among the wool in alternate layers, and the whole lot boiled together until the required depth of shade is reached, generally for an hour or more. It may be mentioned here that the lichens are among the few vege-

table materials which require no mordant, dyeing direct on to the wool. Usually the wool is allowed to cool in the dye liquor to allow it to reach the fullest depth of colour. Always use soft water for dyeing. Rain water is best of all.

As with mordanting, the wool must enter the dye damp. Keep it well covered with liquor and stir it gently from time to time, but not enough to cause felting. The wool is lifted and stirred by means of the wooden sticks, but care must be taken that dye which has soaked into these does not come out again and spoil some light wool with dark stains. That is why glass rods, such as those sold for towel rails, are so much better. They do not

absorb the dye. Prolonged boiling will spoil some shades, e.g., reds and yellows.

After dyeing rinse well in running water and dry. Of course when dry the final shade will be lighter than it appears when the wool is wet.

Materials to Use

A great many vegetable substances will dye wool, and a few others such as cochineal, which, while not of vegetable origin, comes under the heading of a natural dye, being made from minute insects. I cannot do better than quote a very useful little table put out by the W.E.A. under one of their box lecture schemes at Massey College, which gives a useful summary of the more common sources of material and the mordant to use with each, but I would emphasise again that natural dyes in most instances will not produce very brilliant colours, but rather pleasing soft, warm tones.

Acknowledgements

I wish to thank Miss L. Harper and Mrs. P. R. McMahon for helpful suggestions and criticisms during the preparation of this article.

Useful Books

"Complete Guide to Hand Spinning," by K. Grasett. Published by the London School of Weaving, 13 Bryanston Street, Marble Arch, London, W.1. Price 2s. 6d.

"Scouring and Dyeing," by K. Grasett. Same publishers and price as above.

"The Use of Vegetable Dyes for Beginners," by Violetta Thurstan. Published by the Dryad Press, Leicester, England.

"Spinning Wool," Dryad Leaflet No. 83. By the same publishers as the above. All photographs and illustrations by the author.

SUBSCRIPTION RATES.

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Table for Using Mordants

Colour.	Source.	Mordant.
Black (blue)	Maire bark (<i>Eugenia maire</i>)	Alum
..	Hinau bark	Alum
..	Mako Mako (<i>Aristotolia racemosa</i>)	Alum
..	Dock root	Alum
..	Blackberry shoots	Iron sulphate
Blue	Indigo	Alum
..	Privet berries	Bichromate of potash
Blue (grey)	Blackberries, privet berries	Iron
Blue (lilac)	Elderberries	Alum and salt
Brick	<i>Coprosma grandiflora</i>	Bichromate of potash
Brown (yellowish)	Lichen	None required
Brown	Walnuts (green)	Alum
..	Manuka bark	Alum
..	Rimu bark	Alum
..	Bracken tips	Bichromate of potash
Brown (red)	Tanekaha bark (celery-leaved pine)	Alum
Brown (tan)	Flax (root and base of leaves)	Alum
Brown	Bluegum bark	Alum
..	Wattle bark	Alum
Crimson	Rock lichen	Alum
Grey	Walnut husks	Alum
..	Coal soot	Alum
Grey (warm)	Lichen	No mordant
Green	Lichen	No mordant
..	Moss (birch)	Alum
..	Elder leaves	Alum
..	Bidi-bidi	Alum
..	Spinach	Alum
..	Sorrel	Alum
..	Ivy leaves	Alum
..	Gum leaves	Alum
Magenta	Dandelion	Bichromate of potash
..	Sundew	Alum
Old gold	<i>Coprosma robusta</i> (karamu)	Bichromate of potash
Orange	Onion skins	Bichromate of potash
..	French marigolds	Bichromate of potash
..	Wallflowers	Bichromate of potash
Pink (fawn)	Flax flowers (unopened tips)	Bichromate of potash
Pink	Peach leaves	Alum
Petunia	<i>Coprosma (areolata)</i>	Stannous chloride and cream of tartar
Red	Cochineal	Alum, pepper and cream of tartar
..	Lichen (limestone)	No mordant
..	Sorrel (roots)	Alum
Purple	Wild cress	Alum
Violet	Wild cress	Alum
..	Lichen	Alum
Wine	Passion-fruit skins	Alum
Yellow	Dock leaves	Alum
..	Heather	Alum
..	<i>Reseda Luteola</i> (wild mignonette)	No mordant
..	Barberry bark	Alum
..	Mulberry bark (<i>Fustic</i>)	Alum
..	Bracken roots	Alum
..	Lichen (tree and fence)	No mordant
..	Kowhai (flowers)	Alum and ammonia
..	Wallflower	Alum and ammonia
..	Fennel	Alum
Khaki	Walnut husks and gum leaves	Alum
..	Broom twigs	Alum

The Department of Agriculture has been concerned for some years regarding the storage life of onions, and the amount of loss suffered in cool storage and in ordinary shed storage, particularly in unfavourable seasons. It now appears from

By
A. A. POWELL,
Cool Storage Officer,
Wellington.

HEAT STORAGE OF ONIONS

IN view of the economic value of the onion crop and the necessity at the present juncture to consider every avenue of conserving supplies, this method of storage should be thoroughly explored. Due to wastage brought about by the unfavourable weather conditions before and during the harvesting, some growers estimate their losses to be as high as 50 per cent. to 75 per cent. of the crop.

Trial in Progress

To combat such losses a trial with New Zealand-grown onions has been undertaken by the Horticulture and Fields Divisions of the Department of Agriculture with the co-operation and assistance of Messrs. D. A. and A. D. McFadden, onion growers, of Marshlands, Christchurch. The chamber heating and air circulating equipment was designed by the author of this article, and installed under his direction.

The trial is conducted on a commercial basis, with a view to testing (1) whether a forced heating and air circulating system would evaporate the excessive moisture from the neck and skin of the onion and thereby prevent the development of moulds and rots during storage; (2) whether heat storage of this nature would increase the storage and post-storage life of onions.

Insulation

For the purpose of the trial approximately 3000 cub. ft. of an ordinary onion storage shed was converted into in-

sulated storage space. The insulating material used was thoroughly dry wood shavings and sawdust.

Method of Heating

Heating is obtained from 500 watt automatically-controlled finned electric heating tubes 18in. long with terminals at both ends, which are fitted into the air trunk, together with one $\frac{1}{2}$ Brake horse-power electric motor having a speed of 700 revs. per minute direct, coupled to an 18in. diameter air circulating fan. The heated air is delivered by suitably-constructed air trunks, under a false floor from which it is evenly distributed throughout the stacked onions.

local experiences, and from results of experimental work in other countries, that a practical method of prolonging the life of stored onions and preventing wastage may be developed in this Dominion by the use of heat storage.

While for experimental purposes the insulation provided is sufficient, the heating costs can be greatly reduced by increasing the thickness of the insulation in the walls, ceiling, and floor of the chamber and thereby reducing heat losses and the time necessary for heating the chamber each day.

Storing in the Chamber

The onions used in the trial were carefully sorted before being placed in the chamber, to be stored as follows:

1. In the usual type of onion cental bag.
2. In the usual onion bags in a prepared rack to remove weight from the onions.

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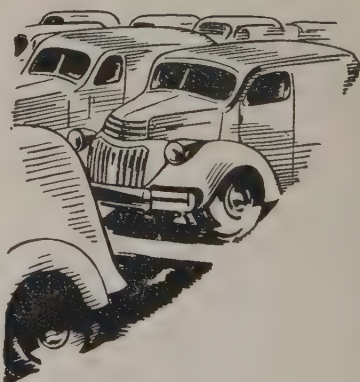
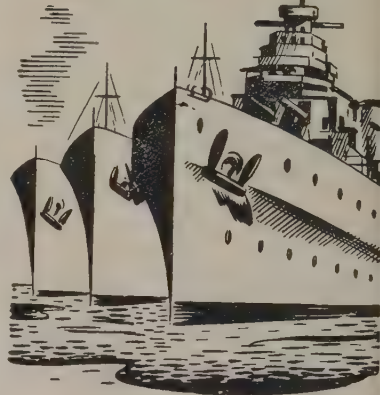
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3. In a specially-designed onion storage case, having dimensions 20 in. x 16 in. x 14 in., and holding approximately 80 lb. of onions. The timber forming the sides and bottom of the case is open spaced, approximately $1\frac{1}{2}$ inches, and angle pieces in the four corners project $1\frac{1}{2}$ inches above the sides to provide ample ventilation when the cases are properly stacked in storage.

The storage temperature of the chamber is maintained at 74 deg. F., and relative humidity at approximately 64 per cent.

Stored under these conditions, the present indications are that the skins of the onions become perfectly dry after being several days in the chamber.

Objects of the Trial

Records are being kept in order to ascertain—

(a) The most suitable temperature and relative humidity for holding New Zealand-grown onions in heat storage.

(b) The effect of a relative humidity of 64 per cent. in the storage atmosphere, with regard to loss of weight in the stored onions.

(c) Loss of weight of the stored onions each month, and over the period of storage.

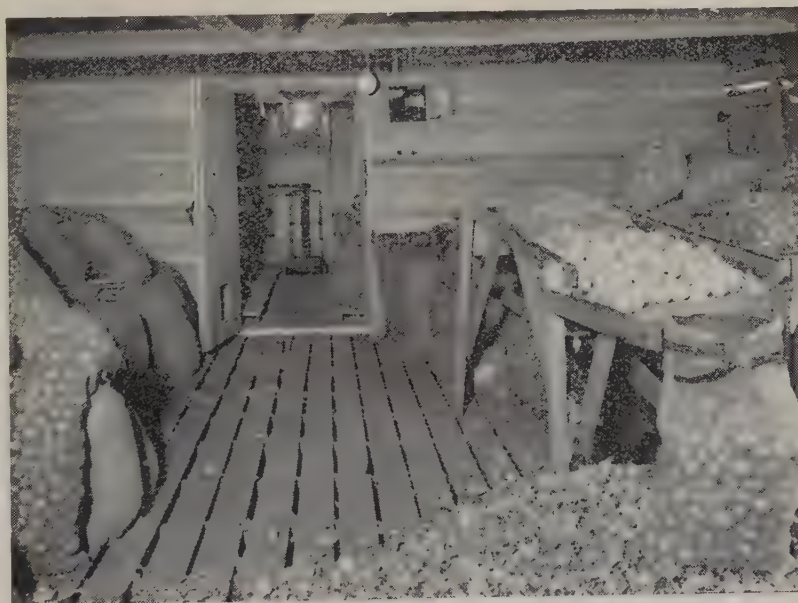
(d) Cost of power for heating per ton of onions over the storage period. It is also intended to investigate later, the forced drying and curing of onions by heat directly after harvesting, in an endeavour to control the development of moulds and stem end rot.

SUBSCRIPTION RATES.

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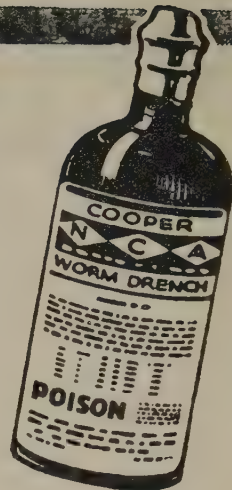


Internal view of heat storage chamber taken from door of chamber.



Interior view of the ordinary storage onion shed with the heat storage chamber at the far end.

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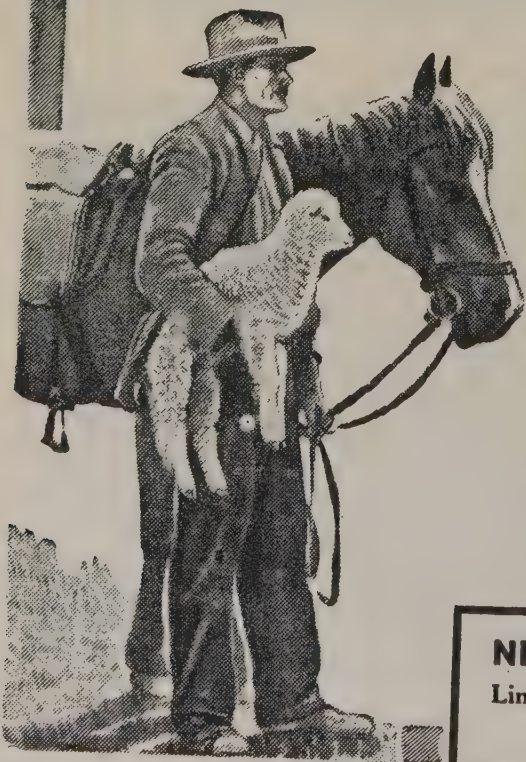
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Veterinary Notes for the Farmer

Mortality in Lactating Sows

EXCESSIVE wastage in the pig industry has been the subject of considerable comment during the past few years. The result is seen in the lower mortality rate on the farm and with better pigs, consequently less condemnations and rejections at the meat works.

The following is an account of some of the losses experienced on a known farm where the general management, including as it does, attention to housing, feeding, sanitation, etc., could still be much improved.

This particular owner has lost numbers of pigs over a period of years from suipestifer infection, pasteurellosis, pleurisy, and so on, but fortunately very few, if any, from tuberculosis. Within the last two months his losses have included three good well-bred lactating sows with litters from three to four weeks old at foot. The sows in each case appeared to be doing reasonably well when, within two or three days of death, a loss of appetite was noticed. Abdominal pain was apparent, the dung was darker than normal, and the animals rapidly became weaker till death ensued.

Cause of Death

On post-mortem the main lesions were found in the stomach, the other internal organs being more or less normal in appearance. The lining of the stomach showed intense inflammation and numerous ulcers up to one inch across were present. The stomach wall itself was much thicker than normal, while about a quart of pure blood clot was found in the

stomach contents—in each case the sow had really bled to death internally.

Now, what caused this picture? It resulted from irritation by the red stomach worm of pigs (*Hyostrogylus rubidus*) a small internal parasite only about $\frac{1}{8}$ in. in length. These parasites appear to be comparatively harmless in the absence of other factors that would affect the general health of the host, but if the resistance of the animal is lowered, as generally happens from bad management, then the above symptoms and lesions may be produced.

Prevention

Treatment is possible, but why think of treatment when the trouble can be

entirely prevented by better methods of management, in this case, by an improvement of the general sanitation through better housing and drainage.

Although losses from this parasite are not common, the above has been brought to the notice of pig farmers generally as another factor in the debt of bad management.

—E. J. CALLAGHAN, B.V.Sc.,
Veterinarian, Hastings.

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Bloat or Hoven in Cattle

BLOAT or hoven is one of the hardy annual diseases on dairy farms, and it is a condition where prompt attention generally produces results. It is due to the accumulation of gases in the rumen or paunch through fermentation of the contents. The ingestion of rich feed, particularly where clover predominates in the pasture is a common cause and the con-

dition is most prevalent in hungry stock or gluttonous feeders.

Symptoms

Swelling of the left flank which bulges upwards and outwards, and increasing uneasiness of the animal. The animal wears an anxious expression, breathes with difficulty, and in advanced cases may stagger or fall when driven. Rumination is suspended. If relief is not afforded the animal may go down and death follow.

Treatment

The method of treatment depends on the development of the case. If seen early, exercise will give immediate relief. Insert a rope smeared with grease or a wooden gag in the mouth,

and keep the animal on the move. Useful drugs are bicarbonate of soda, 1 ounce, ginger 1 ounce, or turpentine 1 ounce. If available two drachms of formalin in half a pint of water may be given.

In advanced cases treatment must be drastic, and the paunch must be punctured at the most prominent point on the left flank, about nine inches below the backbone. A trocar and cannula should be used, or if not available, a sharp knife serves the purpose. A rush of gas shows that the operation has been successful. The formalin solution may then be administered through the cannula. Follow up with two-ounce doses of aromatic spirits of ammonia in a pint of water every two hours while symptoms continue. When the

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animal is on the way to recovery give a purgative drench and put the animal on a light diet for a few days.

Prevention

Prevention is not easy when the feed is very fresh, and often wet. As far as possible avoid grazing animals for long periods on fresh paddocks with a high proportion of clover, particularly when wet. Careful supervision of the herd, however, will often prevent a case developing into a serious one.

A rack of hay in the holding yard is very useful so that cows can eat some hay while standing around at milking time. This will prevent them eating so greedily when they return to pasture. Avoid hard grazing of pastures in winter as this tends to increase the percentage of clover in the spring.

—R. P. GILDER, B.V.Sc.,
Veterinarian, Palmerston
North.

Answers to

Correspondents

Avoiding Milk-Fever.

"J.C.H." (MARTON):—

I wish to administer Calcium Gluconate to a high-producing cow prior to calving as a precaution against milk fever, which the cow has suffered after both previous calvings.

Last season the cow was treated with the hypodermic injection under the skin and it proved most effective, but I thought that if I should give, say, two or three calcium drenches prior to calving, milk fever may be avoided.

I would be pleased, therefore, if such a treatment might prove beneficial, if you would instruct me how to make up a suitable drench and the quantities of each ingredient to be used.

LIVESTOCK DIVISION:—

Although it is not considered that drenching with a calcium drench will always prevent milk-fever in susceptible cows, still good

results have been claimed by owners who have adopted the practice. As you state the calcium salt known as gluconate is used when an injection is given either under the skin or into a vein. On the other hand, when the animal is to be drenched it is more usual to use calcium chloride. The susceptible cows on your farm should be given the fol-

Advisory Service on Veterinary Matters.

Farmers are invited to submit inquiries connected with the health of their stock, and the replies will be published under this heading.

lowing drench twice during the week before calving, and once immediately after.

Two ounces of calcium chloride are dissolved in a pint and a half of hot water, to which is added two pounds of molasses or treacle.

Other preventive measures recommended consist of keeping the suspected cows off young spring pasture for some time before calving, feeding them with hay and other supplementary feed. A good practice is to

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sprinkle the hay with a strong solution of molasses in water.

As milk-fever usually occurs within the first three days after calving, it is also recommended that during this time the udder should not be milked out. All that is necessary is to remove sufficient milk to feed the calf, or to ease the udder should it become distended. With these precautions you should be able to ward off the disease.

Cows Failing to Calve.

"A.E.B." (HERIOT):—

I have four cows which I am unable to get in calf though I have syringed them and I think, done everything possible. I have put my hand in and the womb seems to be closed. I have worked my finger in to make sure it was open, but they still return, not always regularly, at three weeks. Is it lack of minerals? They always have rock salt. Would they be likely to come in calf if they were put dry?

Though only crossbred they are quite good cows. There were five others that returned three or four times, but have been settled for a good while now.

LIVESTOCK DIVISION:—

The normal position for the womb opening is closed and no attempt should be made to open it. Your best method of treatment is to syringe the cow two or three times with the following solution:

Lugol's Iodine	..	2 oz.
Common Salt	..	4 oz.
Water	..	1 gal.

using about a quart to each cow. In addition, provide a lick of the following composition:

Bonemeal or Boneflour
Coarse Agricultural Salt
mixed in about equal quantities, to which may be added Limonite at the rate of 12 lb. to the cwt., if so desired.

Lick for Ewes.

"R.H.W." (TAUPIRI):—

I would be obliged if you would advise the ingredients for mixing a lick suitable for in-lamb ewes with a view to the prevention of sleeping sickness.

I have had no trouble yet, but the disease is in the district.

LIVESTOCK DIVISION:—

A suitable lick for ewes may be prepared by mixing 25 parts of sterilised bonemeal with 75 parts of coarse salt. Although there is no known preparation which may be used to prevent sleeping sickness in sheep this being mainly a matter of good sheep husbandry and management during the last two months of pregnancy, the lick may assist in the digestion of coarse quality feed and at the same time provide certain essential mineral matter in the form of calcium phosphate.

Supplementary feeding with roots and hay, if pastures are bare, together with change of pasture, and even enforced exercise in suitable cases, is

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When Foot-Rot—a chronic, infectious, ulcerative disease—appears in your flock, immediate steps should be taken for its control. Once the disease has developed it may spread rapidly, causing havoc amongst your flock. If your sheep are worth keeping they are worth keeping well. Use Jos. Ford's Foot-Rot Dressing, the liquid antiseptic for individual treatment. Economical and effective.

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AGENTS EVERYWHERE. Without obligation write to us for further information and where to purchase your supplies, or order through your stock firm or merchant.

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more likely to assist in the prevention of the disease than the use of lick by itself. If the lick is used in conjunction with these precautions better results are likely to be obtained.

No Scientific Foundation

"EWE LAMB" (CAVE):—

One evening lately I was at a meeting of farmers where a talk was given on sheep breeding.

The statement was made that, say, if a Romney breeder wished to get his wool a little finer, he could use a Corriedale on his ewes, discard the offspring, and thereafter his Romney ewes with the Romney rams would throw finer-woolled lambs. When I challenged this, being as I thought unscientific, the speaker instanced fox-hound sluts in England being killed as of no further use for

breeding foxhounds if a dog of another breed mated with them. Some hold the same idea regarding draught and thoroughbred horses.

LIVESTOCK DIVISION:—

The belief to which you refer is known as "Telegony," and is a very old and firmly-rooted superstition. It cannot be described otherwise, as it has no scientific foundation whatsoever. Not only is there no way in which such a phenomenon could come about (except by pure coincidence), according to the generally-accepted

Mendelian laws of inheritance, but quite a number of scientific experiments have been carried out to verify this, and all of them have given negative results.

In the particular case which you quote, it is quite possible that the later progeny were on a lower plane of nutrition, which would cause a definite fining-up of the wool without any other factors being involved.

Free Bull Testing Service

THE attention of dairy farmers is drawn to the free bull testing service which will be available again this year. Last season, semen was examined from 78 bulls, of which eight proved to be sterile and another fourteen were of low fertility.

If you are in any doubt concerning the fertility of your bull, get in touch with the nearest veterinary surgeon or stock inspector early in the mating season, who will arrange to collect a semen sample for testing at Ruakura.

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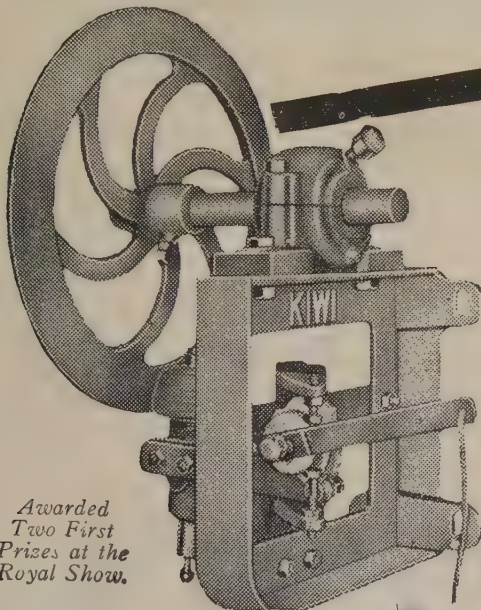
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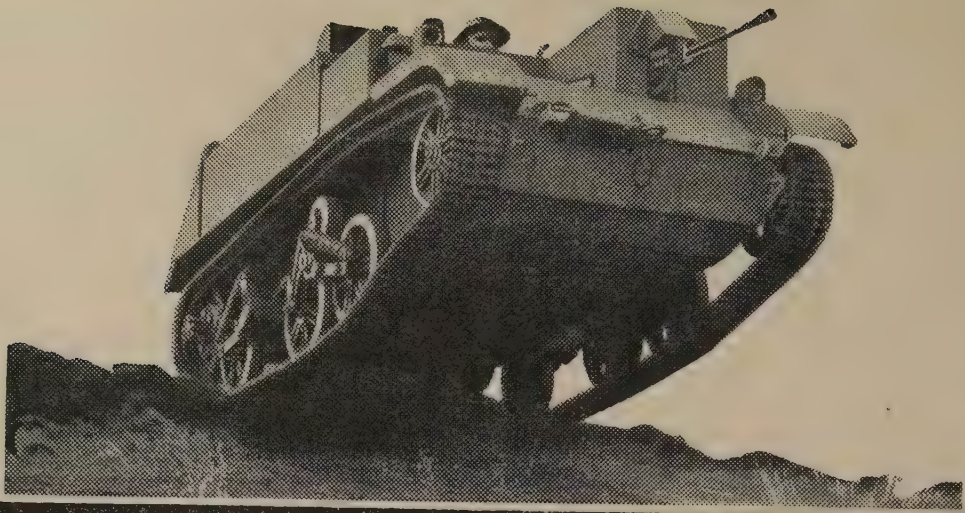
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General Motors salutes the Machine Shops of New Zealand

When the idea of building Universal Bren Gun Carriers in New Zealand was first put forward there were many who said "It can't be done". The task of planning their manufacture and assembly was entrusted to General Motors New Zealand Limited — an exclusive honour which was accepted not only as a tribute to General Motors but also as an incentive to plan and work as never before.

Hundreds of different major parts had to be translated from blue-prints to metal. These parts had to be made in a hundred and one different engineering shops throughout the Dominion . . . so accurately that a part built at the North Cape would fit exactly with a part from the Bluff. A job of planning, of co-ordination, of supply, and assembly which is the

biggest and most worth-while ever achieved by General Motors in New Zealand.

Today this job is an accomplished fact — a job made possible only by the enthusiasm, the willing co-operation and sheer engineering ability of men in machine shops throughout New Zealand.

Today these Universal Bren Gun Carriers are playing their part in the defence scheme of the Dominion. They have been tested and proved in the field, and their drivers have signalled back "Well done". General Motors salutes the machine shops everywhere, which were responsible for this engineering success . . . and are proud to be able to report "It has been done in New Zealand."

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GM.8.24

Farm Practice and Management

Treatment of Pasture Prior to Ploughing

OWING to the restrictions regarding fertiliser quantities, many farmers will this coming season be faced with the problem of maintaining an efficient supply of stock fodder with only some 80lb. or 90 lb. of fertiliser in place of the 336 lb. usually applied per acre in normal times. Obviously hay and silage paddocks will not be able to give normal yields and many farmers will be faced with the necessity of either shutting up a much larger area for hay or silage or of growing an area of some supplementary fodder crop such as mangolds, carrots, turnips, or green cereal fodder.

Such crops will, in all probability be grown at short notice and the farmer will be faced with the problem of dealing with the turf that will require to be ploughed in. The turning under of a thick, strong sward of grasses without some prior treatment is bad farming practice and often results in a poor first crop after grass.

The discing and often double discing of the sward prior to ploughing is strongly recommended. The discs should not be given too much "cut," as it is not necessary or advisable to have the turf cut into ribbons and turned. Where double discing is to be practised, the second cut should be at right angles to the first cut. Where a rotary hoe is available, this makes a first-class job of treating a strong turf prior to ploughing.

Following the discing or rotary hoeing, it is well worth while rolling the worked surface, providing time and the necessary implements are available. This rolling gives back a degree of consolidation to the worked

surface and a mouldboard plough can then turn a furrow without the furrow breaking, and this will ensure that the "well chewed" turf will be buried. Without this rolling there is a tendency for the furrow to break in turning with the result that much vegetation is left on the surface.

Where it is not possible to have the turf worked prior to ploughing, every endeavour should be made to have the

furrow rolled immediately after ploughing. This rolling should follow the direction of the ploughing and will result in the furrow slices being pressed tightly on to the plough pan and this will bring about a better disintegration of the vegetation than were it left in an air space between the furrow slices.

—J. M. SMITH, *Fields Superintendent, Auckland.*



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New plate groups to replace worn Delco and other make cells from 10/-. Guaranteed 2 years, supplied to fit any make glass or rubber jars. State make, number plates per cell, dimensions of jar.

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Slaughtering of Stock

THE following returns of slaughtering of stock at meat-export slaughterhouses and abattoirs for the months of May to July, 1942, have been compiled by the Livestock Division:—

District	Cattle	Calves	Sheep	Of which Ewes were	Lambs	Swine
North Island.						
Meat-export Slaughterhouses—						
Auckland	94,390	130,843	31,027	17,840	109,041	46,247
Poverty Bay-Hawkes Bay ..	28,007	8,827	53,097	33,599	130,048	5,998
Taranaki-Manawatu ..	51,847	25,420	16,202	12,140	130,499	29,899
Wairarapa-Wellington ..	21,188	1,022	22,882	12,119	112,075	5,202
Totals	195,432	164,112	123,208	75,698	481,663	87,346
Abattoirs	34,439	8,955	146,000	65,201	19,612	31,555
North Island totals ..	229,871	173,067	269,208	140,899	501,275	118,901

South Island.						
Meat-export Slaughterhouses—						
Nelson-Marlborough ..	1,244	14	7,516	5,239	38,852	1,951
Canterbury	4,279	3,945	84,106	62,775	290,868	7,437
Otago-Southland	7,204	91	59,776	48,458	515,903	1,644
Totals	12,727	4,050	151,398	116,472	845,623	11,032
Abattoirs	39,054	8,912	169,726	85,320	21,692	36,788
South Island totals ..	51,781	12,962	321,124	101,792	867,315	47,820

Dominion.						
Meat-expt. Slaughterhouses	208,159	168,162	274,606	192,170	1,327,286	98,378
Abattoirs	73,493	17,867	315,726	150,521	41,304	68,343
Grand Totals	281,652	186,029	590,332	342,691	1,368,590	166,721
Same Period, 1941—						
Meat-export Slaughterhouses and Abattoirs ..	212,740	189,203	598,818	385,654	1,554,974	164,578
Same Period, 1940—						
Meat-export Slaughterhouses and Abattoirs ..	264,506	170,435	873,217	573,481	1,427,101	163,369

Slaughtering of Pigs

The 17,655 pigs slaughtered at meat-export slaughterhouses and abattoirs during the month of July, 1942, were distributed in weight ranges approximately as follows:—

Up to 60 lb.	266
61-110 lb.	9,057
111-120 lb.	1,912
121-160 lb.	3,785
161-180 lb.	491
Over 180 lb.	340
Sundries	1,854
111-120 lb.	..
121-160 lb.	..
161-180 lb.	..

The grading of porkers is 84 per cent. of 1st quality and 16 per cent. of 2nd quality, and that of baconers is 79 per cent. of Prime 1's, 15 per cent. of Prime 2's, and 6 per cent. of 2nd quality.

In the different weight ranges of baconers the grading is as follows:—

85%, 12%, 3% of P1's, P2's and 2nds.
78%, 16%, 6% of P1's, P2's and 2nds.
67%, 11%, 22% of P1's, P2's and 2nds.

Radio Broadcasts

RADIO talks to farmers will be given from Station 1YA, Auckland at 7.15 p.m. on the following dates:—

September 28. — "Young Farmers' Clubs' Session," Mr. E. B. Glanville, Provincial Secretary, Auckland Y.F.C. Council.

October 5. — "Results of Current Research in Pig Feeding at the Animal Research Station, Ruakura," Mr. J. H. Woodcock, Animal Research Station, Ruakura.

October 12. — "The Commercial Establishment of a Citrus Orchard," Mr. A. M. W. Greig, Citriculturist, Department of Agriculture, Auckland.

October 19. — "The Care and Rearing of Young Stock," Mr. J. Mullins, Veterinarian, Department of Agriculture, Hamilton.

Pig Industry Broadcasts

Under the auspices of the District Pig Councils concerned broadcasts will be delivered in October as follows:—

1YA, Auckland. — October 15, 7.15 p.m.: "Pig Clubs and District Councils," by H. H. Preston, Supervisor, Northland District Pig Council.

2YH, Napier.—October 8, 7.30 p.m.: "Housing," by I. W. Owtram, Supervisor, Tairāwhiti District Pig Council.

2ZA, Palmerston North.—October 20, 8.30 p.m.: "Care of Young Pigs After Weaning," by J. Marsdon, Supervisor, Wellington District Pig Council.

4YA, Dunedin.—October 12, 7.15 p.m.: "Common Ailments," by H. McDonald, Supervisor, Otago District Pig Council.

A Temporary Stack Fence

WITH fencing wire almost unprocurable and labour at a premium, the adequate fencing of haystacks is a problem on many farms. The illustration shows how one farmer has overcome these difficulties.

Boxthorn trimmings from a nearby hedge have been placed around the stacks in



an impenetrable barrier, and these have effectively protected the stacks from either sheep or cattle. Although the leaves fall in a few weeks, the thorny branches and twigs remain intact and the efficiency of the barricade is retained.

At the end of the season, when the hay has been fed out, the whole is burnt *in situ* with less detriment to the pasture than would have resulted from the usual excessive stock tramping around a fence.

—G. A. BLAKE, Instructor in Agriculture, Hastings.

SUBSCRIPTION RATES.

The *Journal* is issued monthly. The subscription within New Zealand, which is payable in advance and includes postage, is 2s. 6d. a year. The overseas subscription is 5s. Subscriptions should be forwarded or paid direct to any office of the Department of Agriculture in the Dominion. Single copies, price 6d., are available from the Department of Agriculture, Box 3004, Wellington.

Longer Life for Your Tools

VISITORS to the farm of Mr. I. G. Wilson, Matakana, are apt to be somewhat puzzled by the sight of an assortment of farm tools buried to the hilt in what appears to be a box filled with damp sand.

When one of these tools is withdrawn the steel business part is found to be untarnished by any trace of rust. This seems strange, and hence the mystery deepens. Closer investigation, however, discloses that though the sand is certainly wet, this wetness is due to oil and not to water.

For a man who takes some pride in his tools, and who appreciates the difference in working with a sharp, clean spade as compared with a dull, rusty one, this simple device has much to commend it.

The size of the box depends on the number and variety of tools to be accommodated, but a good strong box, say, 3ft. long and 2ft. wide and 14in. deep is well suited for average conditions. The sand should be of good, free, gritty material, and should be thoroughly impregnated with old lubricating oil, such as spent crank case oil. Needless to say, the sand should be well dried before mixing in the oil, and if beach sand is used, it should be thoroughly washed to remove the salt.

Mr. Wilson has used such a box for storing odd tools, such as spades,

shovels, forks, slashers, etc., for some years past. Placed in a conveniently accessible corner of the toolshed, it automatically takes care of all tools not in use, and efficiently foils that foe of the farmer and friend of the salesman—Rust.

— P. S. SYME, Instructor in Agriculture, Warkworth.

Instructions FOR USING YOUR TORCH IN A BLACKOUT

Reviewed and Passed by the
DOMINION LIGHTING CONTROLLER

1—Every home should have one or more torches. But before seeking to buy new ones, inspect and repair old ones. They may need only a new bulb, or fresh batteries.

2—Keep your torch in an accessible place—and *always* in its place. Indoors never point it towards unshielded skylights, windows, or open doors.

3—Do not use unshielded torch outdoors in a blackout except when essential. Keep beam level or downwards—*always*! Never point it towards reflective surfaces.

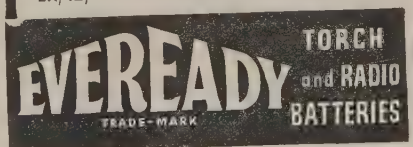


4—How to Shield your Torch for outdoor use: Cut 2 discs of paper, one black with half-inch hole in centre, the other of white tissue paper, or something equivalent, to cover hole in black disc. Insert both discs between bulb and lens of torch.

Keep Your Torch Loaded with
Fresh EVEREADY Batteries
—and have an extra set on hand in case of long-continued use of your torch.

Inserted for the National
and Individual Welfare by
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Alphabet for Growing Root Crops

Always plough early in the winter so that the frosts, air, and rains can "sweeten" the soil.

Bury all turf—it makes good humus. Consolidation of the furrow slice is better obtained by the action of falling rains than by surface rolling.

Don't leave the plough idle until a few weeks or so before sowing time.

Every endeavour should be made to plough the land from four to six months before sowing time.

Frosts will do more to disintegrate the soil particles than will surface cultivation implements.

Gradual preparation of the seed-bed is preferable to rushed surface working in the last week or so before sowing.

Harrow the land during spring and summer to control weed growth.

Increase the natural productivity of the soil by allowing Nature's forces sufficient time to operate.

Joyous is the farmer when he views a bumper crop as the result of his good farm-husbandry.

Kill insect pests and grubs by exposing them to their natural enemies.

Lime should be applied to land of a stiff clay nature, or land inclined to sour.

Mix super and lime some days before being required when sowing swedes, turnips, and rape.

No farmer can expect good crops if he slums the work.

Order your seed and manure in plenty of time.

Prolific crops can be obtained from a well-prepared seed-bed even with a minimum amount of artificial fertiliser.

Quantity and quality is the aim of all agriculturists.

Rolling light soils assists to make a firm seed-bed.

Success in agriculture cannot be achieved by practising the "That is Good Enough" method.

Test all seeds held over from the previous year.

Utilise all farmyard manure available as this is particularly good for the mangold crop.

Very poor crops can be expected if low quality seeds are sown — use "Certified" seeds.

Weeds can be controlled by the use of the inter-row cultivation implements.

Xtra cultivation is always amply repaid.

Yield of crop will be largely determined by the effort at the time of preparation and care during the growing season.

Zig-zag fences of wire netting can be quickly erected to control the grazing of crops.

—K. M. MONTGOMERY,
Fields Instructor,
Te Kuiti.

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"This floor I laid has turned what used to be a damp and dirty shed into a clean, dry, vermin-proof dairy."

Concrete feeding floors prevent food wastage. Concrete floors can be designed to conduct valuable manure to a sump.

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In the Orchard and Vineyard

Orchard Notes

Spraying Apples and Pears

WHEN Bordeaux is applied in the summer months a wetting agent is required to reduce the blotchiness of spray deposit on the fruit. Contrary to general belief oil does not function as a satisfactory wetting agent for Bordeaux, and has been found to increase the blotchiness of the spray deposit.

A suitable wetting agent for use with Bordeaux is casein. Thoroughly mix while dry $\frac{1}{4}$ lb. casein with $\frac{1}{4}$ lb. hydrated lime and shake gradually into one gallon of water while stirring vigorously; add to 100 gallons spray.

It is sound practice to add hydrated lime to the extent of twice the weight of the lead arsenate both when lead arsenate is combined with lime sulphur and when it is not.

Factors of importance in the technique of spray are: (1) The use of certified spray products; (2) the use of correct spray specifics; (3) correct dilutions; (4) correct timing of applications; (5) adequate coverage; (6) efficient equipment.

Grafting

Grafting may be carried out during September and October and a commencement can be made as soon as the bark lifts readily. The essentials for successful grafting are: (1) Good sharp knife; (2) sharp pruning saw; (3) scions in fresh and dormant condition; (4) care in cutting scions and stocks; (5) the contact of the cambium layers of scion and stock; (6) careful tying, or tacking with brads; (7) the use of a satisfactory grafting wax to exclude all air.

Grafting may be done by de-heading the tree and inserting the scions in the main branches or by skeletonising the tree and inserting the scions in the

stubs of the larger laterals and along the branches. The former method is the quicker and is the best method to follow when grafting small trees. The disadvantage with this method is the time taken to regrow the framework before fruiting can be expected. The latter method, while taking longer, has

Current Work.

Complete spring ploughing.
Apply cover sprays of lime sulphur and colloidal sulphur (see spray schedules for pip and stone fruits).

Attend to grafting.
Apply quick acting manures.
Cultivate soil to secure good tilth.
Clean around trees to reduce shelter for pests such as Bronze Beetle.

the advantage of utilising the existing framework and fruiting of the new variety may usually be expected within $2\frac{1}{2}$ years.

Spring ploughing should be completed as soon as possible and the soil worked to a fine even tilth.

—R. G. I. HAMILTON, District Supervisor, Horticulture Division, Auckland.

SPRAY SCHEDULE FOR PEARS.

Period of Application.	Treatment.		Disease and Pest.
	Clean Orchard.	Infested Orchard.	
Dormant (1)	—	Winter Oil 1-16 to 1-19 ..	Scales. Red mite. Pear leaf blister mite.
Early green-tip	Bordeaux 5-4-50	Bordeaux 5-4-50	Black spot.
Open cluster to Pink (2) ..	Bordeaux 3-4-50	Bordeaux 3-4-50	Black spot.
Petal fall	Bordeaux 3-4-50	Bordeaux 3-4-50	Black spot.
	Lead arsenate $1\frac{1}{2}$ lbs.—100	Lead arsenate $1\frac{1}{2}$ lbs.—100	Codling moth.
Fourteen days later	Ditto	Ditto	Ditto.
Eighteen to twenty-one day intervals to January and later as required.	Ditto	Ditto	Black spot. Codling moth. Leaf roller. Leech.
January to February (3) ..	—	Summer Oil 1-80 to 1-100. Two applications at 10-day intervals.	Red mite. Scales.

(1) With an oil content of concentrate 80 per cent. use dilution 1-16.
With an oil content of concentrate of approx. 100 per cent. use dilution 1-19.

(2) For varieties susceptible to Bordeaux injury lime sulphur 1-150 plus colloidal sulphur (40 per cent.) 2lb.-100 may be substituted for Bordeaux in this and later sprays.

(3) Do not apply within fourteen days of sulphur sprays.
With an oil content of concentrate 80 per cent. use dilution 1-80.
With an oil content of concentrate of approx. 100 per cent. use dilution 1-100.

SPRAY SCHEDULE FOR APPLES.

Period of Application.	Treatment.		Disease and Pest.
	Clean Orchard.	Infested Orchard.	
Dormant (1)	—	Winter Oil 1-16 to 1-19.	Scales. Woolly aphid. Red mite.
Early green-tip	Bordeaux 5-4-50	Bordeaux 5-4-50	Black spot. Powdery mildew.
Open cluster to Pink	Lime sulphur 1-150	Lime sulphur 1-100	Black spot. Powdery mildew.
Petal-fall (2)	Lime sulphur 1-200	Lime sulphur 1-150	Black spot.
	Colloidal sul. 1lb.-100 (40%)	Colloidal sulphur 2lb.-100 (40%)	Powdery mildew.
	Lead arsenate 1½lb.-100	Lead arsenate 1½lb.-100	Codling moth.
	Hydrated lime 3lb.-100	Hydrated lime 3lb.-100	Bronze beetle.
Ten to fourteen days later ..	Ditto.	Ditto.	Leaf roller.
Fourteen to eighteen day intervals to mid-December	Ditto.	Ditto.	Ditto
Eighteen to twenty-one day intervals to end of January and later as required (3)	Ditto.	Ditto.	Ditto
	or Bordeaux 1-2-50	or Bordeaux 1-2-50	Black spot.
	Lead arsenate 1½lbs.-100	Lead arsenate 1½lbs.-100	Powdery mildew.
	Plus spreading agent.	Plus spreading agent.	Bitter rot.
January to February (4) ..	—	Summer Oil 1-80 to 1-100.	Ripe spot.
		Two applications at 10-day intervals.	Codling moth.
			Leaf roller.
			Red mite.
			Scales. Woolly aphid.
			Leaf hopper.

- (1) With an oil content of concentrate 80 per cent. use dilution 1-16.
 With an oil content of concentrate of approx. 100 per cent. use dilution 1-19.
- (2) On varieties susceptible to russet omit lime sulphur from this spray onwards and use colloidal sulphur at double the strength shown.
- To control leaf hopper combine nicotine sulphate at 1-800 in this or following spray.
- (3) The alternative programme is required where Bitter Rot (*Glomerella cingulata*) or Ripe Spot (*Neofabraea malicortis*) is prevalent, but should not be applied to Golden Delicious.
- (4) Do not apply within fourteen days of sulphur sprays.
- With an oil content of concentrate 80 per cent. use dilution 1-80.
 With an oil content of concentrate of approx. 100 per cent. use dilution 1-100.

Citrus Notes

Plant Nutrition

TO obtain an adequate crop of good quality fruit, fertilisers and manures should be applied to make up for deficiencies caused by the removal of plant food from the soil by the growing trees and crops.

In planning this manurial programme to best advantage a knowledge of plant nutrition is of assistance to the grower, and in the accompanying notes is set out the 18 elements generally required in the nutrition of plants, especially those concerned for citrus trees.

1. Carbon

Chemical symbol: C.

Occurrence in nature:

Solid: Diamond (crystalline); animal and vegetable charcoal (non crystalline and impure).

Gas: With oxygen as carbon monoxide and carbon dioxide which comprises three to four parts in 10,000

parts of atmosphere. It is renewed by respiration of plants and animals, through combustion and also from volcanoes. With hydrogen as hydrocarbons, e.g., ethylene and acetylene.

Compounds: Carbonates, e.g., lime or calcium carbonate.

Function in Plant Physiology: Constituent of all living organisms. Essential part of protoplasm. Chemistry of carbon compounds known as organic chemistry. Fifty per cent. of dry weight is carbon.

Method of Absorption by the Plant: As gas, carbon dioxide, in the atmosphere, through process in green leaves known as photo-synthesis. The gas enters through the stomata of leaves. By this process the carbon of the air combines with water absorbed from the soil to form carbohydrates, of which starch is the first visible product. Necessary conditions: sunlight,

atmosphere with carbon dioxide, temperature, adequate water supply.

Recommendations: Vigorous and healthy foliage essential. Improve soil texture so that water supply regular. Apply farmyard manures, for these not only supply other elements but also in decomposing increase the carbon dioxide of the air around the tree.

2. Hydrogen.

Chemical Symbol: H.

Occurrence: As a free gas in volcanic gases..

Function: Soil acidity is measured by the hydrogen ion concentration or pH. pH scale ranges from 0-14 with neutral point at pH7 (water). pH values below 7 are acid, above 7 are alkaline. Sourness is due to the hydrogen ion and the hydrogen ion concentration of a soil is more important than the potential power to neutralise alkalies.

3. Oxygen.

Symbol: O.

Occurrence: Oxygen forms 1/5th of atmospheric air.

Function. Essential for respiration and the release of energy. It enters the plant as a gas through the stomata of the leaves and green stems, and the lenticels of mature stems. It also enters the roots from the soil air.

Hydrogen and Oxygen Combined: as Water.

Symbol: H₂O.

Function: Water is essential for all life processes. For every part of dry matter formed 200 to 1000 times by weight of water must be absorbed by the roots. Hydrogen and oxygen form carbohydrates with carbon. These carbohydrates are a constituent of the cell wall and are an intermediate stage in the production of protein.

Method of Absorption by the Plant: From the soil, water enters the plant by the suction pressure of the root hairs. From the root, there is a common stream, the transpiration current, which passes up the stems and out by the leaves. In New Zealand, citrus soils depend on rainfall. Part of this water evaporates, part runs off the surface, and part enters the soil. Of that part which enters the soil only some is available to the roots; the rest passes down by gravity or is too firmly held by the soil particles.

Recommendations: Plants want as much water as they can get, provided the soil is not so saturated that the air supply is deficient. Improve

the water-retaining property of the soil and thus conserve the rainfall. Add organic matter to the soil—leguminous cover crops or even weeds. Farmyard manures maintain the organic matters status of the soil and hence the soil structure.

Humus helps the soil to act as a sponge, water being withdrawn by the plant as required. When the water supply is inadequate plants wilt, shed their leaves, or drop fruits. Leaf stomata close, and photo-synthesis is reduced. The transpiration current is greatest in dry weather. A birch tree

with 200,000 leaves will transpire 15½ gallons of water per day. Wind increases transpiration, so reduce the effects of wind by providing adequate shelter.

—A. M. W. GREIG, *Citriculturist, Auckland.*

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Guide for the Home Garden

October Work in the Home Garden

"We must keep our heads above the waves somehow, until they calm."—Napoleon Bonaparte.

IF definite directions could be given concerning fertiliser applications, crop production would, indeed, be considerably simplified. This, however, is not practicable, owing to factors such as soil type and texture, organic and calcium soil content, location, climatic conditions, rainfall, crops previously grown, system of production—intensive or otherwise. These considerations, and others, contribute to the impracticability of adopting any hard and fast rules concerning the use of manures or fertilisers.

While it may be possible to state, in a general way, the nutrients required by many vegetable plants, it would be much more difficult to determine, with any degree of accuracy, what kind and what quantity of fertiliser should be applied to any particular kind of soil, in order to secure maximum crop production. Analysis may show the plant nutrient content of certain soils, but it fails to determine whether the fertilisers are present in a suitable condition for assimilation by plants.

To be successful with vegetable production, the home-gardener should observe and note the results which accrue from the use of different kinds and combinations of manures and fertilisers. Taking the long view for maintaining the garden soil in a fertile condition, farmyard and organic manures would appear the most suitable, combined with necessary additions of inorganic fertilisers.

Luxury Crops

These may be hard to define, but the production of crops which might be classed as essential food should be the first call on the home-gardener's available time. The skill and ability to produce luxury crops could be more profitably utilised in the production of those vegetables which constitute the first line of defence of the family health requirements.

Commercial market gardeners have been deprived to no small extent of the skilled labour which was formerly employed, and this must result, during certain periods, in restricted market supplies of vegetables. In view of

this probability, every effort should be made by those who have the available garden space, to produce the maximum, even if it should mean the temporary abandonment of an area of land being used as a lawn, and that being used for the production of flowers.

Sweet Corn

Conditions at present obtaining in the Dominion suggest that further consideration might be given to more extensive production of this vegetable, which is so deservedly popular with our allies, the Americans. Its position in the dietary of the average American citizen signifies clearly how very important the crop is. In popularity and economic importance, sweet corn ranks with such staple vegetables as tomatoes and cabbage.

It is planted extensively for home-use, for local markets, and for commercial canning. (The State of Maine alone processes upwards of 34,000,000 cans annually.) Statistics published by the Crop Reporting Board of the Bureau of Agricultural Economics indicate that in 1937, 952,100 tons of sweet corn was used in manufacture.

Production—Climate

For the best development of the sweet corn crop, warm temperatures are necessary, both night and day, plenty of sunshine, and a fertile, well-drained soil that will retain abundant moisture. Light frosts will injure the plants, as also will prolonged periods of wet, cold weather, and excessive dry conditions.

Soil

The crop can be grown on almost all types of soil, provided it is well supplied with organic matter, and is situated in such a position that it will warm up quickly in spring. It can, with advantage, follow pasture, ploughed in autumn, or a good heavy green manure crop.

Failing either of these, the land may be heavily dressed with farmyard manure. On soils which have been liberally supplied with farmyard manure, superphosphate applied at the rate of 1lb to 12 feet of row—approximately half-ton per acre—should give good results.

Planting

Varieties recommended are "Golden Bantam" (early) 125 seeds per oz., "Country Gentlemen," 230 seeds per oz., and "Stowell's Evergreen." It will be evident from the foregoing figures that the weight of seeds of different varieties vary considerably. Allowing for 70 per cent. germination, it should not be difficult to determine the quantity of seed necessary to plant the area required.

For garden production "hills" or "clumps" are recommended. Half a dozen or more seeds are planted in a circle, 1-1½ inches deep—and the four strongest plants permitted to grow. The hills should be spaced 36 inches apart each way. It is advisable to grow the plants where the high foliage will not unduly shade other crops in the garden. As the plants grow, suckering from the root will take place, and, provided these are removed early, the results may be beneficial. Many growers, however, do not trouble to remove them. Field production may be in continuous rows, 36 inches apart, and 8-10 inches between the plants.

Cultivation

Hoeing, whether by hand or power, must always be shallow. The plant is shallow rooted, and substantial damage may result if deep cultivation is practised. As the top growth may tend to throw the plant out of balance, a slight banking of the soil against the base will be an advantage.

Harvesting

To determine the correct time to pick and use the cobs requires some experience

What to Do in the Home Garden Next Month

Summary of Operations During October

SUCCESSIONAL SOWINGS.

Lettuce (when planting, must be watered in), beans, peas, celery, turnips, radish, spring onions, sweet corn, spinach.

OTHER SOWINGS.

All gourds (when danger of frost has passed), carrots, parsnips (main crops), cabbage, cauliflower, broccoli, kale, beetroot, leeks.

PLANTS TO SET.

Potatoes (main crop), tomatoes, lettuce, silver beet.

PERENNIAL CROPS.

Rhubarb—stalks of matured roots may be pulled till Christmas. Asparagus—spears of well established beds may be cut from 7 to 8 weeks. Two to three-year-old

roots—spears should be harvested sparingly, two to three weeks respectively. Immediately harvesting is finished, give a dressing of blood and bone—two handfuls to each crown for old beds, and one handful for younger ones—with a liberal application of wood ashes and soot.

CROPS IN SEASON.

(The month in brackets represents the month of sowing seeds). Beans—broad (May to June); dwarf and climbing (mid October to early February). Artichokes, Globe (September). Beetroot (almost all the year). Broccoli (September to January). Brussels sprouts (September to December). Carrots (July to April). Cauliflower (June to December). Egg plant (mid October). Lettuce (May to February).

and observation. When the "milk" stage of development has been reached, the crop is in its best and most nutritious condition. This is followed by the "dough" stage, and the cobs are then not as tender as they formerly were, and quickly become unpalatable. If a couple of grains are gently pressed with a finger nail and to this pressure they yield readily their internal creamy substance, then the correct harvesting time has been reached.

The cobs are ready to harvest so soon as the "tassel" has withered. They may be removed by cutting with a knife, and used as quickly as possible after harvesting. The husk should not be removed from the cob until just before cooking. This will assist in preserving the quality of the seeds.

On suitable land, in close proximity to allied camps, a considerable quantity of sweet corn might well be produced. It would, no doubt, be greatly appreciated.

Tomatoes

Provided the plants are being home-grown, they should, by the middle of October, be well established, and hardening-off should be started without delay. This is done by gradual exposure of the plants from cover protection, in conjunction with water restriction. The plants must not, however, be allowed to

become stunted or starved looking, with that undesirable hard, bluish appearance. Should this condition become noticeable, apply at four-day intervals a solution of nitrate of soda, one tablespoon to four gallons of water.

Planting and Manuring

The last week in October—Labour Day—is time enough for setting out

the earliest plants. Except in a few special places in the Dominion, there is little to be gained, and a great deal to lose, by planting before this date.

Provided the ground is available, it may be dug and a shallow trench opened at the place where it is intended to set the plants. Along this opening, blood and bone manure may be applied at the rate of 1lb. to 15 feet of row, and, in addition, a couple of

SEED AND TABLE POTATOES

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handfuls of superphosphate. Before raking the soil back, drive a peg at either end of the trench. This will serve as a marker, and ensure the ground being reopened at the same place, and the plants set where the manure was applied. In the shallow trench set the plants to the depth of the first two leaves, and heel the soil firmly against the root. When the trench becomes filled in by after-cultivation, the plant will have greater stability, owing to the depth it has been planted. If it is intended to train the plants to a single stem, a stake should be placed near the plant as soon as convenient.

Beans

This is a valuable crop for domestic use, and one which, if properly cared for, will more than repay the labour expended on it. The seed, however, should not be planted until danger of frost has passed. Dwarf varieties are more suitable for early cropping, but climbing varieties will, with correct treatment, produce supplies over a much longer period. For continuity of production, the beans must be picked when young. If picking is neglected, the pods remaining will start to ripen, and the plant will cease to grow.

A motto which, with slight modification, might very well be adopted with regard to this crop is: "Use what you can and can what you can't." Preserving beans when young and tender is

simple and inexpensive, and will furnish a desirable change of green vegetable during the winter months.

Dwarf varieties recommended are: The Prince, Tender and True, and Sydney Wonder. Climbing: Emperor, Epicure, and Market Wonder.

Pumpkins, Marrows, etc.

So soon as danger of frost has passed, seeds of any of the gourds may be sown. Early vegetable marrows may be obtained by sowing seeds in four-inch flower pots, or any suitable receptacle which will hold a few seeds, and which affords some drainage. If the seed is sown and cared for, inside a house or well-lighted shed, two weeks may be gained by having the young plants set out at the same time as the seed would otherwise be sown.

Capability of retaining abundant moisture is a necessary condition of the soil for this crop. Subsequent watering should be in the nature of a thorough soaking. Provided the crop is being grown on land which had been well manured for a previous crop, a good handful of superphosphates to each "hill" will no doubt be sufficient fertiliser to supply the food requirements of the plants.

Varieties—Marrows: Long White Bush. Pumpkins: Triamble, Queensland Blue. Squash: Warren, Golden Hubbard.

Green Vegetables for Winter Use

Preparations for growing all the green vegetables for winter use should now be started. Valuable garden space need not be used for producing the necessary plants, as these may be grown in seedling boxes, which must, however, be not less than six inches deep. To provide desirable plants, the soil used in the boxes should be a mixture of good loam, three parts, and sharp sand, one part. Buy only the best seeds of proved strains of the varieties required, and sow sparingly. Include leeks in your selection.

Potatoes

Early potatoes will now be requiring attention. Hoeing and spraying should be attended to. Every care of the plants is necessary if the best results are to be secured from the seed which has been used. Neglect of spraying with Bordeaux mixture as protection against blight attacks is the direct cause of much wastage, loss of seed, labour and manure, and the prospective crop. There is no fungicide known which will give more efficient protection against potato blight than Bordeaux mixture applied as a spray.

Tomatoes

A Special Appeal to Home-Gardeners

IN view of the increasing popularity of and the exceptionally heavy demands which will probably be made upon available supplies of tomatoes produced by commercial growers, the necessity for increased production by home-gardeners cannot very well be over-stated. In this respect, those who are fortunate enough to own suitable land in areas where tomato production can be safely undertaken, have an additional responsibility to consumers not so favourably situated.

By intensive methods of production, enough tomatoes can be grown to completely satisfy one's own requirements—and, perhaps, some to spare. Provided this is done, more of the tomatoes which may be marketed will be available to meet consumer demands.

In view of the uncertainty of supplies of citrus fruits, the outstanding nutritional value of the tomato should be particularly stressed. "Food Products," a book by H. C. Sherman, gives the tomato the following food-rating:—

	Vitamin A. Anti-rachitic.	Vitamin B. Anti-beri-beri. Anti-neuritic.	Vitamin C. Anti-scurvy.
Raw	++	+++	+++
Cooked	++	+++	+++
Canned	++	+++	+++
Dried	++	+++	+++

++ means good source, and +++ means an excellent source of vitamin.

It should be particularly noted that the tomato has one great outstanding merit—none of its vitamin value is lost through cooking.

Lettuce

Lettuce which may not be manifesting much growth can be assisted to maturity by occasional applications of liquid manure. Plants which remain too long in the garden before maturity become distinctly unpalatable. To achieve the crisp texture of leaves and heart and the desirable nutty flavour, plants must be quickly grown.

Keep young celery plants clear of weeds and assist development by frequent applications of liquid manure.

—D. K. PRITCHARD, Instructor in Vegetable Culture, Wellington.

Seasonal Work for Beekeepers

Converted Sack Hand Truck Used in Honey House

TO improve working conditions, and also to overcome the problem of labour shortage as much as possible, each beekeeper should check over his apiary and honey house equipment and decide where improvement can be effected to maintain production at its maximum.

From the commencement of the honey flow until the last extraction is completed, large numbers of supers have to be moved several times from the honey house to out-apiaries, entailing considerable time and labour. By using a converted sack truck, such as illustrated, a very satisfactory improvement in the handling of both full and empty supers may be effected.

The foundation of this labour-saving equipment is an ordinary grain store truck which is procurable with either metal wheels or rubber-tired wheels on roller bearings. The latter type is more expensive to purchase; but the ease of running and absence of any risk of damaging the honey house floor more than compensates for the difference in price.

Construction

Three minor adjustments are necessary. The metal toe of the truck should be replaced with one which will protrude about 13 or 14 inches, as shown in sketch A. This new toe should be made of good steel and be properly tempered, as it has to stand up to a considerable strain. An addition of two pieces of wood (light angle iron may be used) should be suitably

fixed to the frame of the truck, as illustrated, to meet the supers when they are perpendicular. This adjustment is necessary so that the centre of gravity of the load is kept over the wheels and a better balance obtained.

To assist the operator in tilting the truck to the wheeling position a foot lever has been added by Mr. J. P. Ireland, of Te Rapa. This device, shown in sketch B, is a piece of flat iron, steel bolted to the frame of the truck in such a way that when pressure is applied by the foot the arm acts as a lever on the axle of the truck, and thus assists the hand to tilt the load more easily.

Utility

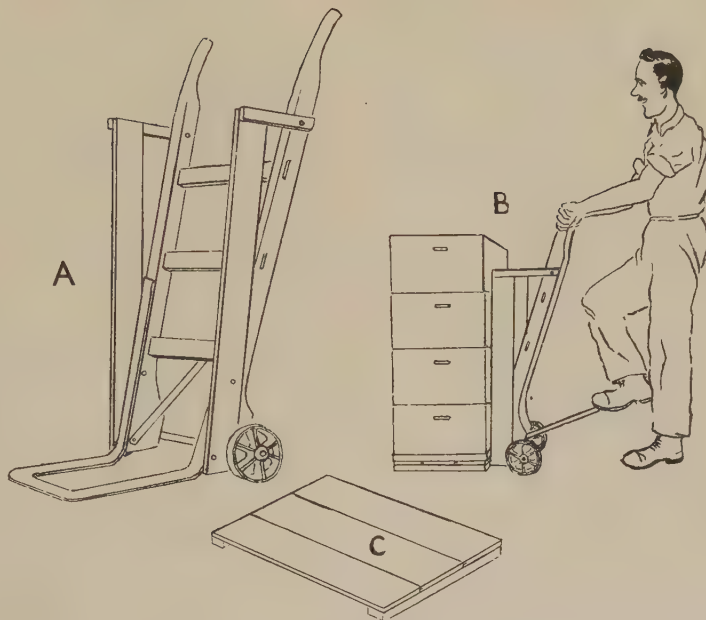
The many uses to which this truck may be put will be governed largely by the number of light bottom boards constructed, as shown in sketch C, size 20in. x 16in. It is essential that all supers or cases of honey be placed on

these bottom boards, so that the toe of the truck can be readily placed underneath the load without tilting. If suitable timber is used in their construction, the bottom boards could, if desired, replace drip trays, which are shown in use in the accompanying sketch.

Where this hand truck is used as suggested, and the unloading bank is the same level as the floor of the motor truck, four full supers can be trucked into the honey house at a time, and the honey house floor kept free of drips of honey, while the work is speeded up immensely.

Late in the season when the bees are inclined to be troublesome, quick loading and unloading of the apiary lorry by means of this converted sack hand truck will be appreciated.

—C. R. PATERSON, Apiary
Instructor, Hamilton.



(Apiary Notes continued on page 176.)

Notes for the Poultry Farmer

Brooder Management and Prevention of Chicken Mortality

THIS article is intended to be a short description of the main points concerning brooder management. The present acute shortage of paper prohibits the publication of a detailed survey of chick-rearing.

Attention to Detail

Careful observation, infinite patience, and willingness to pay strict attention to detail are the personal factors which are essential for successful rearing. Method in management is important, but the work must not become mechanical. Success means not only low mortality, but a state of even growth among the chickens brooded—a fact often overlooked.

Poultrykeepers are urged to study the following points relating to the causes of mortality and uneven growth.

1. Day-old Chicks

Obviously, if badly hatched the problem is an incubation one, which no amount of careful attention during brooding will rectify. Poor quality chicks bred from **immature pullets** or hens, lacking in constitution, are a further source of trouble. Such chicks lack inherent constitution and average livability, and never have a chance of developing into well-grown pullets or cockerels. Start with good chicks,

..... By F. C. BOBBY, ...
Superintendent of Poultry
Husbandry, Wellington.
.....

culling out all cripples and weaklings before they reach the brooder.

2. Diseased Chicks

Should heavy losses occur during the brooding period, forward several chicks, as soon after death as possible, to the Superintendent, Animal Research Station, Wallaceville, where they will be examined and a post-mortem report sent, free of charge. This is the only safe method of ascertaining the real cause of death; guessing is dangerous and costly. Act as soon as trouble is observed, since disease may appear at any time after the chicks reach the brooder.

The best form of insurance against an outbreak of disease or a subsequent spread of disease, is cleanliness in every detail. Maintenance of dry litter, especially under the brooder, frequent removal of droppings, constant cleaning of all food and water utensils, using a disinfectant, and clean runs outside the brooder-house are all essentials connected with the control of disease. Often the first batch of

chicks of the season receive this attention, while the later hatches suffer from the want of it.

3. Type of Brooder

Whatever the type of brooder used it is essential that the owner be fully acquainted with the correct method of running it. Without this knowledge, losses, with poor and uneven growth, may occur. If in doubt inquire from a neighbouring poultry-keeper with a similar type, or write to the poultry instructor at the office of the Department of Agriculture in the district (Auckland, Wellington, Christchurch, and Dunedin)

4. Heat and Ventilation

Unsatisfactorily heated and badly ventilated brooders are the cause of much mortality, and subsequently many poor flocks of pullets. Young chicks must have easy access to ample heat, which supply of heat should not be seriously affected by changes in the temperature of the brooder-house. At no time should the chicks be forced to crowd together near the source of heat, but it is equally important that they should not be forced to remain in an over-heated brooder. Both conditions will lead to chills.

A slight excess of heat should be available during the first week, but the chicks **must always be able to get away** from this heat and spread themselves out comfortably. Should it become necessary to close up the sides of the brooder with curtains or other devices in order to conserve sufficient heat for

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THE POULTRY MANAGER, Massey College, Box 601, Palmerston North.

the chicks, it is almost certain that satisfactory ventilation cannot take place.

In practice a thermometer is useful to check up the temperature under the hover before putting in the chicks, but once under the hover the chicks themselves will indicate to the observant rearer whether the temperature is satisfactory. Day-old chicks should have access to a temperature of 90 deg. F., and after the first week this temperature may be gradually reduced until at about four to five weeks, according to the conditions prevailing, heat is no longer required.

Having regard to satisfactory ventilation, the best practical test is to note whether the litter under the hover becomes damp overnight. It should remain dry unless (a) the litter is resting on a damp floor (i.e., green concrete), or (b) the litter is dirty and saturated with moist droppings. Damp litter is caused by the chicks "sweating" and passing moisture in their breath, all of which moisture faulty ventilation fails to clear from under the hover.

A method now employed to avoid damp litter and sweating is the use of a wooden frame covered with small mesh ($\frac{1}{2}$ in.) wire-netting placed under the hover. For the first week this frame is covered with sacking, upon which is placed ordinary litter. After this initial period the sacking may be removed, allowing the 7-10 days old chickens to rest upon the wire-netting, when all possibility of sweating and dampness is removed. Poultry-keepers are warned that **no advantage** is gained by using wire frames and sacking if the latter is allowed to accumulate moisture; in fact, deep litter, frequently changed under the hover, directly under the floor would be preferable.

5. Overcrowding

It is possibly no exaggeration to state that more broods of chickens are spoilt by overcrowding than any other

adverse factor in rearing. Poultry-keepers must realise that the capacity of a brooder is the maximum number of chickens the brooder will carry satisfactorily at the maximum age it is intended to retain the chickens under the brooder. Thus, if a brooder will carry 100 chicks (but no more) satisfactorily at a day old, those chicks will be overcrowded at four weeks of age—unless the brood is reduced in number before that time.

Equipment manufacturers invariably state the maximum number of **day-old** chicks that their brooders will carry—not the number of chickens this brooder will rear to five weeks of age. Thus, generally speaking, a 240-chick hover will rear satisfactorily approximately 120 chicks to five weeks of age. Under-stock rather than over-stock at all stages during chicken-rearing is a golden rule for ultimate success.

6. Feeding

Although feeding cannot be discussed in full, two practical points of importance may be mentioned. During the early stages of rearing (0-10 days), the essence of successful feeding is "little and often," while care should be taken to remove all food, after a meal, which has not been cleaned up in, say, 20-25 minutes. Feeding chickens is a skilled job and not a mechanical one.

7. Rickets

Where chickens—after 5-6 days old—are retained in a brooder-house and not exposed to a reasonable amount of direct sunlight, it is necessary to supply 2 to 2½ pints of cod-liver oil in every 100lb. of mash mixed for them. Without this oil, containing vitamin D, poor growth, uneven feathering, and advanced rickets (leg weakness) may be expected. **Neither green food nor milk will protect chickens against rickets**—direct sunlight or cod-liver oil are the only two alternatives.

When purchasing cod-liver oil, inquire whether any statement or guarantee is issued with the oil, stating the number of units of vitamin D present in the oil. A good average oil should contain 80-100 units of vitamin D. It is impossible to ascertain by inspection whether a sample of cod-liver oil is satisfactory for chicken-rearing—therefore purchase a reputable brand, even if it costs slightly more per gallon.

8. Draughts

Young chickens are particularly susceptible to draughts, and great care must be taken to avoid floor draughts.

It is a satisfactory practice to place a metal, wooden, or cardboard "surround," 12-18in. high, round the hover for the first 5-7 days. This has the advantage of preventing chicks from straying away from the hover, and at the same time of preventing draughts. The "surround" may be placed about 9-12in. from the hover on the first day, and from that time onwards it is gradually opened outwards, giving more space to the chicks. Food and water are given inside the surround during this early stage.

Summary

Start with good chicks, pay attention to detail, supply good quality food, and don't overcrowd. Remember that a poultry instructor will be pleased to offer advice on any chick-rearing problem, and inquiries should, accordingly, be addressed to him without delay.

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Method of Feeding Chickens at The Poultry Station, Wallaceville

Part 1.—Brooder Stage

Day-old to 5 weeks (approximately).

WHEREVER possible the chicks are placed under the brooder in the late afternoon and given water to drink. This water is not stone cold, but has the chill taken off. The first meal is given on the following morning, and consists of a chick feed No. 1, made up as follows:—

Finely cracked wheat	60 lb.
Maize grits	20 lb.
Finely cracked groats (hulled oats) ..	20 lb.

100 lb.

This mixture is given five times daily during the first 5-6 days, as much grain being given at each meal as the chicks will clean up in about 20 min-

utes. No grain is left before the chicks between meals. As the mixture is fed to the chicks on a special board or paper, all food left over is easily removed. In addition the chicks always receive hard metal grit suitable in size to young chicks. Fine oyster-shell is not considered hard enough for this purpose.

On the sixth day introduce dry mash in open, flat troughs allowing ample feeding space for the chicks to feed comfortably and without competition between the strong and the less robust chicks. The mash fed consists of:

Pollard	20 lb.
Wheat-meal	33 lb.
Bran	20 lb.
Maize-meal	10 lb.
Skim-milk (or buttermilk) powder ..	10 lb.
Meat-meal	5 lb.
Minerals	2 lb.

100 lb.

Plus 2 pints of high-grade (100 units vitamin D) cod-liver oil.

The mineral mixture consists of 1lb. common salt and 1lb. oyster-shell dust.

After the sixth day the programme is approximately as follows:—

Early morning feed	Chick feed No. 1.
8 a.m.	Put dry mash before chicks.
11 a.m.	Take mash out and feed grain.
2 p.m.	Put dry mash before chicks.
Last feed	Chick grain, and remove mash troughs.

After first week fine chopped young green food is given morning and evening.

At the fifth week wet mash (same mash as given dry previously) is introduced once daily and the dry mash gradually cut down until, when the chickens are moved out on to free range in colony houses, they are ready for two wet mashes daily with no dry mash. The feeding programme is as follows:—

Early morning	Grain feed.
8 a.m.	Put in dry mash.
11 a.m. to noon	Remove dry mash.
2 p.m.	Wet mash feed.
Last feed	Good grain feed.

It may be noted that after the fourth week the chicks are given a No. 2 size chick feed consisting of:

Coarse cut wheat	60 lb.
Hulled oats	20 lb.
Coarse maize grits	20 lb.

100 lb.

Part 2.—Free Range

6-20 weeks (approximately).

After moving out to range into the colony houses, no change in feeding is made for about a week. Change of housing, general conditions, and feeding should not all be made at once. Following this short period, the chickens are given a grain feed early morning and evening, with a wet mash in the morning and afternoon. The mash mixture during the growing period is as follows:—

Pollard	24 lb.
Wheat-meal	33 lb.
Bran	25 lb.
Maize-meal	10 lb.
Milk-powder	3 lb.
Meat-meal	3 lb.
Minerals	2 lb.

100 lb.

Grain Mixture.

Wheat	80 lb.
Kibbled maize	20 lb.

100 lb.

It will usually be found necessary to take out the meat-meal altogether after four months of age—more especially if the pullets are maturing too quickly. Hard grit and green food are essentials throughout the growing period. The pullets are moved into laying quarters as soon as they show signs of "reddening up."

Where liquid milk is used for mixing with the mash, then the milk-powder may be reduced and later dispensed with altogether.

APIARY NOTES—Continued from page 173.

Reminders for the Month For Beekeepers

Keep a close check on stores and do not leave the hives open any longer than is necessary for a quick examination.

Where feeding is necessary do not allow any flying bees to get at the combs of honey while they are being distributed, otherwise robbing may develop.

Where conditions are favourable for robbing, the combs should be carried in supers on a barrow, well covered with clean corn sacks.

Never use honey for feeding purposes unless it is obtained from colonies free of all brood troubles.

Where honey is not available for bee feeding at this time of the year, a mixture of equal parts sugar and water is best for brood-rearing purposes where required.

For best results the syrup should be luke warm and fed out late in the day, giving the bees no more than they are able to take up during the night.

Disturb the bees as little as possible and contract the entrances to all hives.

Replace all damp hive mats and clean the bottom boards of all refuse.

—T. S. WINTER, Senior Apiary Instructor, Wellington.

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Federation of Young Farmers' Clubs

Report of Annual General Meeting

THE eighth annual meeting of the New Zealand Federation of Young Farmers' Clubs (Inc.) was held this year at Dunedin. The Dominion president, Mr. D. S. Ross, of Te Puke, Bay of Plenty, presided over a gathering of close on fifty delegates.

All four Councils were well represented; the four council chairmen, Messrs. R. J. Reid (Otago-Southland), T. E. Streeter (Canterbury), S. G. Avery (Wellington), and D. E. Waide (Auckland) were present, and the fact that for the first time in the history of the Federation all four chairmen are active club members, is worthy of note.

The meeting was characterised by the very apparent determination on the part of those present to keep the Y.F.C. movement alive, and so, to use the words of the president, honour the promise made to the members serving with the fighting forces.

The balance-sheet revealed the very satisfactory credit of £232 15s. 3d., after sums of £100 each had been disbursed to the four Councils.

Election of Officers

Mr. D. S. Ross was re-elected as Dominion president for the second term, and Mr. R. J. Reid was elected as vice-president. Mr. J. Barclay was re-elected as Y.F.C. representative on the Dominion Executive of the New Zealand Farmers' Union, and Mr. D. S. Ross as the representative on the National Council of Primary Production. Mr. C. H. Schwass was re-elected hon. treasurer, and Mr. A. P. O'Shea hon. auditor, both gentlemen being thanked for their services during the past year.

Y.F.C. Policy

The matter of policy was again reviewed; recommendations from the Dominion executive committee were discussed at length, and finally reworded and carried as follows:—

"That, recognising the present difficulties and those that are likely to arise, this annual general meeting is of the opinion that, although there must be a very definite curtailment of the activities of the movement, every effort should be made to continue the organisation.

"To that end it is suggested that (a) club activities should be carried on within the limits imposed by their relying on their own resources; and that wherever possible clubs should be encouraged to function; (b) councils should continue in office, constituted as in their opinion is desirable; (c) the Dominion executive committee should still continue to function as constituted."

Remits

Following a remit sponsored by Mr. A. C. Cameron "That, recognising the national importance of the farming community making its full contribution to the leadership and development of this Dominion, this conference urges all Y.F.C. councils, district committees, and clubs to do their part towards developing the qualities in the individual so essential if this aim is to be achieved; a sub-committee consisting of Messrs. Cameron, Laery, Reid, La Roche, and Whyte, to go into ways and means whereby the ideas expressed could be carried out. It was also recommended that clubs should compile a Leadership Roll to do honour to those members who have shown the qualities of leadership and the willingness to undertake responsibility.

Among other business the following resolutions were carried:—

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New Zealand Federation of Young Farmers' Clubs (Inc.)

Balance Sheet 1941-42

LIABILITIES.				ASSETS.			
	£	s.	d.	£	s.	d.	
To Sundry Creditors—				By Cash at Bank	232	15	3
Affiliation Fees received but not yet disbursed to Councils:				Sundry Debtors—			
1941/42	31	4	6	Affiliation Fees Outstanding ..	156	1	0
1942/43	7	0	0	Stock in Hand (Stationery, etc.) ..	21	0	9
				Film Projector £110	0	0	
Affiliation Fees payable to Councils but not yet received			38 4 6	Less Depreciation	16	10	0
Accumulated Funds Account—				Trophies	93	10	0
Balance as at 1st May, 1941	274	2	7		25	10	0
Plus Excess Income over Expenditure	60	8	11				
			334 11 6				
			<u>£528 17 0</u>				<u>£528 17 0</u>

"That the names of conscientious objectors who refuse to serve the country in a non-combatant capacity, if or when called upon to do so, be deleted from the membership of the Y.F.C. movement." Happenings in a certain club had rendered it necessary to safeguard against any such trouble that might, although improbably, occur elsewhere.

"That clubs going into recess must make formal application to their district committee to do so." It was considered that this would enable district committees to assist the weaker clubs where possible, and ensure that the books and funds of clubs in recess were held in trust by the district committee.

"That the federation support the Dominion President of the Farmers' Union in the establishment of a reserve corps of workers in essential industries." A minority voted against, and asked for it to be recorded that they considered the present position could be rectified without the provision of permanent labour.

"That the federation adopt the principle of a memorial to Y.F.C. members who have lost their lives whilst serving overseas." Whilst approving of the establishment of a memorial fund, the meeting was not prepared, at this stage, to decide on what form the memorial should take, nor the manner in which funds so collected should be expended.

"That, with the view to encouraging members of clubs that are in recess to keep in touch with the movement, district committees should endeavour, through the advisory members, to con-

tact as many such members as possible." The position in regard to "unattached" members was fully explained.

The matter of the holding of national competitions was left to the discretion of the Dominion executive committee, it being realised that while at the present time these activities must remain in abeyance, it was quite feasible that conditions might improve to the extent that they could be resumed before the war was entirely over.

A motion of sympathy with the relatives of club members who have made the supreme sacrifice whilst serving overseas was carried, the meeting standing for a few moments out of respect.

The venue of the next annual general meeting was fixed for Palmerston

North, about the same time, the exact date to be finalised later. The meeting closed with a hearty vote of thanks to the chair.

On the day preceding the meeting, visiting delegates were the guests of the Otago Southland Council, a very interesting tour of Dunedin having been arranged; the tour included an inspection of Messrs. Reid and Gray's Implement Works and also of the Steel Roller Mills, the latter being unique in the Dominion. In the evening delegates were entertained at the pictures.

Reports on Club Activities

EASTERN SOUTHLAND.

Dipton.—Team selected for district inter-club debate. Roll of Honour compiled. Lecture by Mr. Lindsay Craig on "Gold Dredging and Panning."

Orepuki.—Reports by delegates to annual general meeting. Decided to enter a team in the inter-club debate. Annual ball to be held; half-profits to go to Patriotic fund. Dance committee appointed. Arrangements for club debate.

SOUTH OTAGO.

Warepa.—Arrangements for working bee to tidy up local cemetery. Lecture by Mr. W. L. Jourdain, Government Poultry Instructor, on "The Management of a Flock of Hens to Ensure Maximum Egg Production"; the speaker dealt very fully with all aspects of his subject, such as feeding, housing, correct breed, size

and shape, rearing of chicks, methods of overcoming parasites, etc.

NORTH OTAGO.

Enfield.—Interesting address by Mr. A. Hellewell, who has recently returned from service overseas; he gave a graphic description of the type of farming carried out in the Nile Valley, Egypt, and detailed the methods used by the natives. He also spoke about the British advance into Libya, November, 1941.

SOUTH CANTERBURY.

Arno.—Officers elected at annual meeting: Advisory president, Mr. E. C. Wright; chairman, G. G. Thomas; secretary and treasurer, T. Turner. Despite a limited member-

(Continued on page 181.)

HE WENT FORTH



ARMY.

Name.	Club.	Name.	Club.	Name.	Club.
Atchison, A. C. ..	Clevedon	Ellis, E. ..	Masterton	Johnston, J. M. ..	Hinds
Algie, A. ..	Alfredton	Edmonds, H. ..	Alfredton	Jones, J. M. ..	Kaukapakapa
Algie, L. ..	Alfredton	Eagle, K. ..	Alfredton	Jepson, M. ..	Levin
Anderson, W. ..	Enfield	Ewart, J. ..		James, C. ..	Murchison
Barnes, J. ..	Masterton	Eagle, F. A. ..	Wairoa	Johnston, I. A. K. ..	Palmerston
Bliss, C. ..	Carterton	Falloon, E.* ..	Masterton	Jesse, P. A. ..	Wairoa
Bray, H. ..	Fairlie	Fisher, S. W. ..	Carterton	Jesse, J. T. ..	Wairoa
Barwood, D. ..	Fairlie	Fairey, E. N. ..	Meeanee	Jobson, W. G. ..	Wairoa
Bartholomew, P. B. ..	Levin	Foster, B. ..	Te Karaka	Jardine, J. E. ..	Wairoa
Blenkhorn, G. ..	Levin	Grieg, Wm. ..	Masterton	Keats, F. ..	Masterton
Blackburn, R. D. ..	Levin	Grieg, W. ..	Masterton	King, H. A. ..	Alexandra
Bedggood, J. O. ..	Te Karaka	Govan, W. ..	Alexandra	Kebbell, R. ..	Alfredton
Bullock, W. R. ..	Te Karaka	Gray, S. L. ..	Bulls	Koia, B. R.† ..	Meeanee
Bretherton, H. ..	Wairoa	Gallerhar, T. ..	Fairlie	King, W. ..	Meeanee
Browlie, J. E. ..	Wairoa	Gimblett, G. F. ..	Levin	Lane, L. F. ..	Clevedon
Browlie, J. N. ..	Wairoa	Gibson, J. A. ..	Levin	Loye, N. G. ..	Mangaweka
Brownlie, R. J. ..	Wairoa	Griffiths, W. J.† ..	Meeanee	Lynch, K. J.* ..	Murchison
Bell, D. ..	Wairoa	Gould, F. L. ..	Murchison	McKenzie, A. E. ..	Wairoa
Campbell, R. H. ..	Masterton	Goodley, R. E. ..	Wairoa	McGregor, M. ..	Masterton
Cross, M. W. ..	Warepa	Henderson, E.○ ..	Masterton	McLachlan, W.○ ..	Masterton
Cummock, W. ..	Alexandra	Hunt, D. R. ..	Masterton	McKay, A. ..	Masterton
Cooney, T. ..	Alexandra	Hara, O. ..	Masterton	Maddever, P.○ ..	Masterton
Crampton, A. ..	Fairlie	Heenan, D. ..	Alexandra	Mathias, G. B. ..	Alexandra
Candy, E. ..	Levin	Hellewell, A. S. ..	Enfield	McCarthy, O. ..	Alexandra
Cornes, H. B. G. ..	Meeanee	Hitchcock, N. ..	Palmerston	McDonald, F. ..	Alfredton
Cole, M. S. ..	Murchison	Hall, J. G. ..	Wairoa	McDonald, T. ..	Alfredton
Duckett, H. ..	Masterton			Milne, J. L. ..	Carterton
Doyle, M. ..	Masterton			Martin, C. ..	Enfield
Davidson, L. G. ..	Hinds			McNaughton, R. ..	Enfield
Draper, C. ..	Kaukapakapa			Munro, H. ..	Fairlie
de Lautour, B. ..	Wairoa			McGuire, S. J. ..	Kaukapakapa
de Lautour, D. ..	Wairoa			Montgomery, R. G. ..	Meeanee
de Lautour, E. ..	Wairoa			Milligan, J. W. ..	Murchison
de Lautour, H. M. B. ..	Wairoa			Miller, D. ..	Teddington
de Lautour, P. A. ..	Wairoa			MacKay, F. K. ..	Wairoa
Durdy, C. ..	Wairoa			McKenzie, O. ..	Wairoa
Devery, N. ..	Wairoa			McKenzie, E. ..	Wairoa
				Munro, D. C. N. ..	Wairoa
				Napier, N. ..	Alfredton

* Killed in action.

† Missing.

‡ Prisoner of war.

§ Wounded.

○ Returned.

|| Returned wounded.

Missing, presumed killed.

‡ Killed in air operations.

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N.S. 17/27

Name.	Club.	Name.	Club.	AIR FORCE.	
Nordlof, F.	.. Alfredton	Scott, D.	.. Alexandra	Brisco, D. G.	.. Masterton
Newell, N. J.	.. Levin	Smith, S.	.. Alfredton	Bradnock, J.	.. Masterton
Nesbitt E. B.†	.. Meeanee	Swinn, P.	.. Carterton	Berney, B.	.. Alfredton
Nelson, A.	.. Meeanee	Shanks, M. J.	.. Kaukapakapa	Coon, J.	.. Masterton
Norris, E.	.. Murchison	Somerville, N. A.	.. Kaukapakapa	Cruickshank, A. C.	.. Masterton
Pearse, H. C.	.. Masterton	Smith, I. T.	.. Palmerston	Cook, D.	.. Clevedon
Paton, W.	.. Fairlie	Scott, E. T. A.	.. Wairoa	Clarke, F.	.. Hinds
Powdrell, E. S.	.. Wairoa	Stanley, D.	.. Wairoa	Dunford, R. G.	.. Bulls
Powdrell, R. J.	.. Wairoa	Smyth, N.	.. Wairoa	George, H.†	.. Alfredton
Quill, A. C.	.. Fairlie	Tredray, J.	.. Masterton	Hudd, S.	.. Masterton
Rayner, Wm.*	.. Masterton	Tomlinson, T. W.	.. Masterton	Murphy, J. W.	.. Mangaweka
Richards, O. H.†	.. Masterton	Thurlow, J.	.. Murchison	Palmer, T. R.	.. Bulls
Rowley, B. D.	.. Mangaweka	Thomas, I. L.	.. Wairoa	Sainsbury, P.	.. Wairoa
Russell, R. B.	.. Alexandra	Taylor, W. D.	.. Wairoa	Wright, J. H.	.. Masterton
Ryan, P.	.. Alexandra	Vallis, T.	.. Masterton	Wilton, T.	.. Masterton
Rankin, R.*	.. Alexandra	West, J.	.. Masterton	Weston, R.	.. Alfredton
Russell, C. M.	.. Bulls	Welch, C. J.†	.. Masterton		
Rayner, C. R.	.. Carterton	Welch, L.	.. Masterton		
Rose, M.	.. Carterton	Wingate, J. G.	.. Masterton		
Rowland, A.	.. Enfield	Weaver, E.	.. Alexandra		
Rowland, J.†	.. Enfield	Watson, W. A.	.. Wairoa		
Ross, J.	.. Wairoa	Winter, B. G.	.. Wairoa		
Scott, T.	.. Masterton	Yuil, W.	.. Enfield		

NAVY.

Raynor, O. R.	.. Masterton
Peter, J.†	.. Alexandra
Ross, G.	.. Alfredton

REPORTS ON CLUB ACTIVITIES.— (Continued from page 178).

ship, this club is still carrying on, with fewer meetings throughout the year.

Cannington-Cave.—Officers elected at annual meeting. Chairman, D. Sewell; secretary and treasurer, R. McKenzie. This club is virtually in recess for the war period, but it has been decided to hold special meetings when the occasion warrants it.

Geraldine.—Decided to hold meetings fortnightly for a while. General discussion on papers dealing with "Ewe Management" and "Lucerne." Arrangements for a visit to the local linen flax factory. At previously unreported meetings: Debate, "That Modern Methods of Farming are Detrimental to the Farm." Won by the negative. A talk and demonstration by Mr. Hughes on "How to Thatch a Stack," and an exhibition of sound films by Mr. C. C. Leitch, Department of Agriculture. Officers elected at the annual meeting: Chairman, C. Kelman; vice-chairman, K. Hibbs; secretary, P. Temple; treasurer, I. Sheed; advisory presidents, Messrs. Crotty and Little.

Pleasant Point.—Parcels to be sent to members overseas. Talk on "The Care of Saws," by Mr. Jesseman. Officers elected at the annual meeting. Advisory presidents, Messrs. D. M. France, R. Crombie, and R. D. France; chairman, R. S. France; secretary, H. W. Jackson; treasurer, D. B. Gardiner.

MID-CANTERBURY.

Ashburton.—H. Bennett elected as chairman, in place of E. McClelland, whose resignation was regretfully accepted; B. Lambie elected to committee in place of H. Bennett. Practice debates in preparation for the forthcoming district inter-club debate.

Hinds.—Impromptu speeches. Team selected for debate as follows: W. Taylor, R. Cocks, D. Chesnall.

Methven.—Debating team selected. Arrangements for a visit by the Darfield Club. Talk by Mr. R. J. Low on "General Farm Management."

CHRISTCHURCH.

Darfield.—One new member enrolled. Talk by Mr. M. Clair on his "World Tour."

Ellesmere.—Eight new members enrolled. Lantern lecture by Mr. Harris on "Soil Survey in New Zealand." There was an attendance of 23 members.

SOUTH CANTERBURY.

Scargill-Omihi.—Capt. Crowther gave an interesting talk on his "Seafaring Adventures"; this was followed by a dance. There was an attendance of 50, comprising 22 members and 28 guests.

MANAWATU.

Feilding.—One new member enrolled. Mr. Cockcroft, veterinary surgeon, outlined a scheme for dealing with livestock that might become injured during an air raid, and also explained the treatment that could be given for minor injuries.

Rongotea.—Business meeting. Balance-sheet of dance submitted; proceeds to be used for patriotic purposes. Motion of sympathy to

Messrs. R. O. and J. P. Gloyne. Letters of thanks to be sent to Mr. L. L. Marsden for his lecture on "Pig Production" at the previous meeting and to the Rongotea branch of the W.D.F.U. for their help in preparing supper at the dance.

NORTHERN HAWKE'S BAY.

Matapiro.—Prepared speeches given by members.

Meeanee.—Informal talks by members.

TE KUITI.

Paewhenua.—Members delivered prepared addresses of five minutes' duration, and answered questions on same. This procedure is to be adopted at the next meeting. Mr. P. H. Parr to be asked to give an address on "The Art of Debating."

WESTERN BAY OF PLENTY.

Paengaroa.—Arrangements for club's sixth birthday, this to take the form of a dance and card party. Arrangements for a field day on Mr. J. Gulliver's farm. Address by Mr. D. S. Ross, Y.F.C. Dominion President, on his "Tour of England and the Continent"; he made special reference to London and its vast areas of residential and business premises.

Te Puke.—One new member enrolled. Practice for final debate against Eastern Bay of Plenty.

EASTERN BAY OF PLENTY.

Whakatane D.H.S.—Talks by Mr. J. R. Murray, Department of Agriculture, and Mr. Whitham on "Winter Grazing on Dairy Farms." Mr. Murray's talk was illustrated by lantern slides.

Health Notes for the Farm

Stop Worrying About Your Food

ARE you food conscious? Are you one of those people who worry all the time about what is going on inside you every time you have a meal? If you are, you're in danger of becoming unhealthily conscious of what your foods contain. Of course, if you feel that your food is the right food and is doing you good then you're definitely on the right track. Keep on that way. Those who worry unnecessarily about their food are doing themselves much more harm than they realize.

The thing to do is to see how far your feeding habits conform to correct principles; adjust any faults or deficiencies; and then, having reformed your habits just try to forget all about your inside. If that advice is followed, you'll quickly notice the difference—you'll be better off in every way mentally and physically.

A Harmful Idea

There is a very wrong and very harmful idea among some people that nearly every disease and physical ailment can be cured by some system of dieting. During the last few years when people have taken a keener interest in the food they eat, from the scientific angle, their eagerness to learn all they can about nutrition has led them into the mistake of sometimes taking too much notice of false and harmful advice. They are inclined to listen too much to food faddists who are concerned chiefly with what they can make out of it, when they should be seeking the timely aid of reliable doctors.

This exploiting of false dietary notions is a serious menace. They won't cure your troubles. When you need medical attention, go to a doctor. You cannot cure everything by some particular rule about diet, in spite of all the quackery you are asked to listen to. Go to your doctor if you want advice.

Some Fallacies Upset

Now, let's look at a few food fallacies. There is a widely held idea that certain foods should not be combined at one meal—notably proteins and starches. The belief is founded on the mistaken impression that starches require an alkaline medium for their

Contributed by the
DEPARTMENT OF HEALTH.

digestion and proteins require an acid medium. There is, however, abundant proof that the digestion of starch is not prevented under normal conditions by the acid of the gastric juices.

Actually, many of our staple articles of diet, such as cereals, beans, and peas contain both protein and starch. Also, if we followed this protein-plus-starch theory a lot of our old-established and wholesome dishes would have to be wiped right out of the menu; such popular combinations as meat and potatoes, bread and milk, bread and cheese, potatoes and milk and egg and bread.

And here's another fad. Many people worry about acid-forming foods, and draw up elaborate menus to provide alkali-forming meals. It is just a waste of time. Our bodies are quite capable of dealing with the small amounts of acid that result from the digestion of food.

The Digestive Process

If people understood a little more about the body machinery it is probable that they would take a keener interest in keeping it in proper working order. Most of us rarely spare it a thought until something goes wrong, and an overhaul is needed.

The stomach is one of the most important parts of the human body. It is almost constantly at work and the way in which it stands up to that work and to abuse is remarkable.

In the course of a year the stomach of the average New Zealander consumes and turns into heat and energy a prodigious load of food. Apart from incidentals, over 2cwt. of meat; 3cwt. of fruit and vegetables; 2cwt. of cereals (bread and so on); 20 dozen eggs; almost a box of butter; and 30 gallons of milk are required to keep one man in proper condition throughout the year. Imagine how big a pile of food that amount would make! And, if the meat ration were cut down by a third and the milk intake doubled, the same man would be a lot better in health.

Now, what happens when the stomach gets to work on this food? After food is swallowed regular muscular contractions of the stomach mix it thoroughly. At the same time diluted hydrochloric acid and a substance called pepsin act chemically on the food and cause marked changes in the proteins and albumens. Before the food mass is ready to pass from the stomach, it has been reduced to a thick liquid. It passes through a valve into the small intestine, where the most intense digestion takes place. Here the pancreatic juice and bile become active and protein, fat and starch are all split up into simple chemical substances that can be readily absorbed into the blood.

Absorption of Nourishment

When it is converted into a substance resembling milk in colour and consistency, numberless little finger-like projections on the intestine walls separate and absorb the useful material from the waste. This material is carried into veins, and from there into the smallest blood vessels. If the diet is properly balanced all the elements necessary for the proper rebuilding of the parts destroyed by usual wear and tear of daily existence are replaced.

The transformation of food into body is a complicated sort of business, so complicated that even destructive emotions like fear and worry, and anger, can upset it tremendously, but with ordinary care and adherence to a sensible diet the stomach will be kept in proper working order, and continue to give wonderful service.



THE

Good Neighbour

BY MARY

From Me To You

LAST night I did some rummaging. Do you like rummaging? I love it. It's such fun to go exploring amongst the treasures of the past, and last night I delved deep into my treasure box, which holds many souvenirs of happy days now gone forever.

Memories are so beautiful. Do we not all indulge in a little dreaming of the past now and then? Amongst other things, I came across an old autograph book which I had in my school days. It was fun reading all the bits and pieces written therein, most of them in childish handwriting, some of them very trite, and others very original. But every entry in my little pink-covered autograph book recalled the smiling face of some one I had known in days gone by, and although our paths are now wide apart, and I shall probably never see again those friends of childhood days, I still remember them.

With the entries for this month's competition still running through my mind, this little verse seemed to be particularly appropriate. I remember that my auntie wrote it in my book for me, and how I liked it!

"Give me a draught of laughter
Before the day begins,
Let troubles follow after—
'Tis the laughing heart that wins.
Proffer me golden laughter
When clouds obscure the sun;
No matter what comes after
With laughter work's well
done."

Isn't it a tonic in itself? And talking about tonics, will you agree with me if I say that the best tonics often don't come out of bottles? By this I mean that some of our friends are often more instrumental in cheering us up than all the bottles of tonic on the market. I recall particularly one lass I know—how I wish you knew her too! With dark hair, and merry eyes, her happy little laugh is enough to chase away all the worries of the world. She is like a ray of sunshine penetrating through a dark and gloomy wood, and every day is left richer because of having known her, and having laughed with her. I think her motto must be the old saying that goes "The most wasted of days is that on which you have not laughed." I know, judging on that standard, that not one of her days will ever be wasted, and anyway, how can time be used better than in cheering others as you go on your way?

Laughter is I think the most infectious quality I know. How often we laugh heartily at some incident, however small, just because someone else is laughing with us! And without laughter life would be dull and dreary, so next time you want to cheer someone up, just have a laugh with them.

Do you know the words of the poem written by John Masefield called "Laugh and Be Merry?" It is a cheer germ in itself, and here is one verse for you:

"Laugh and be merry together, like
brothers akin,
Feasting awhile in the rooms of a
beautiful inn,
Glad till the dancing stops, and the
tilt of the music ends,
Laugh till the game
is played, and
be you merry,
my friends."

Mary

Mary's "Cit Home"

I AM on the verge of an exciting adventure myself just now. A friend of mine has asked if she may set one of my poems to music. That pleases me considerably. And it has had the direct result of making me decide to learn how to write music for myself. It will mean study, lots of it perhaps, but a marvellous reward in the end.—London Lass, Wellington.

THE competition for war-time substitutes provided some interesting reading, and one does appreciate the

practical ideas set forth. What struck me most was the patience involved by Biddi-Jan's suggestion of always withdrawing the elastic from garments before washing. 'Twas an example of patience, me thinks, worthy of the long life of the precious elastic. My nearest attempt to such a proceeding is an aid to drying through the winter months, and that is to remove pyjama cords from the trousers, when washing them. This removes the bulk round the hem, and they dry much quicker.

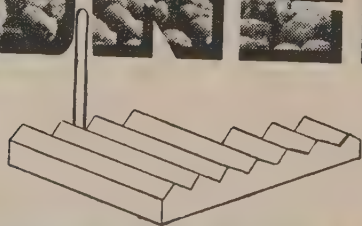


GUARDIANS OF THE NIGHT . . .

When "flak" flames across the sky and searchlights wave their frantic fingers, then the men behind the guns become guardians of the night. The men who fight by night and sleep by day need extra comfort, and they bless their ONEHUNGA Blankets. Should you have any difficulty in obtaining your full requirements of ONEHUNGA Blankets, remember that the needs of the Forces come first. But we hope with you that the ONEHUNGA mills may turn soon from war to peace—and that ONEHUNGA Blankets will once more become YOUR guardians of peaceful nights.

ONEHUNGA

Blankets



ONEHUNGA TRAVEL RUGS ★ AIR CELL BLANKETS ★ ONEHUNGA WOOLLENS

When all is dry again, they are easily rethreaded.—**Roundabout, King Country.**

I DO want to send you my warm appreciation for letting us all share with you the letter from G.M.B., Puketapu. It is people like this who will make possible a post-war world worthy of our soldier lads. For months and years they need to bring to their daily lives a big measure of courage. They live in an unnatural world of life and death. They see the strain of war unveiling before their eyes, exactly what men have made of themselves, and how big they can become. When they return, many of them will want to feel that the people left behind developed and grew in the things that matter too.

Recently I listened into the service at St. Martin-in-the-Fields, London, which broadcasts the Empire service on the third Sunday in each month. It is something I wouldn't miss unless reception is too bad; this journey with the Empire in a great circle of worship and prayer. My mind goes to thousands of people perhaps away back in Australia, Canada, Africa, New Zealand, and many other places, joining together, making in my fanciful thoughts strands of a huge cobweb of love and praise. This time the preacher spoke of the attitude we bring to bear in the things around us—that can give us the inward grace we need these days. He said: "In the little, humble, everyday problems, as well as in the important ones, the Lord has turned defeat into triumph by the attitude he brought to bear on them."

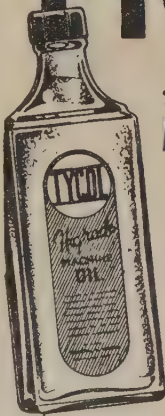
This I would say of G.M.B.'s letter, and would add, how can we other "Good Neighbours" also hoist our flag on high, and keep it bravely flying? By banishing gloom, and defeat from each day—not thinking of life ahead in huge slices of months or years of strain or worry—this will perhaps make it easier, and to keep our courage a day at a time will turn the weakest of us into real soldiers.—**Tiggetty Boo, Kati Kati.**

WE are just farmers, starting off on our first year of farming on our own. Very interested in the work, but finding things tough to start off. However, we are hoping for great things in the future. It is a great word, that little word "hope." It carries one over the rough places.—**"Brynmaur," Aramoho.**

SOME of the remarks made by friends in your circle of "Good Neighbours" tempt me to tell you of a very good neighbour whom I lived beside for many years. My little boy, seven years of age, met with a painful accident which necessitated a stay in hospital for nearly a year. His eighth birthday was about to be celebrated in hospital, and father and three sisters were going nearly fifty miles to spend a few of the birthday hours with him. It came in a very busy season, and mother was left to carry on at home, and all day was in a very wistful mood. But think of her delight, when they returned at night, to say that a very thoughtful, next-door neighbour had sent a huge cake over to Sonny, with eight little candles. The candles were lit, and the cake shared with all who were in the children's ward at the hospital.—**Nanna, Motueka.**

I HAVE been growing two hyacinths on my office desk in a bowl of bulb fibre. One is pink and the other lavender. We have christened them Priscilla Anne the pink one, and Leone Margaret the lavender one. The pink one is a mass of flowers, and today I put them out on the window sill, and there is the faintest tinge of lavender showing through, so I'm hoping that by next week there will be a pigeon pair to exhibit proudly to everyone. As a matter of fact I doubted for a while if they would survive, as everyone in the office comes and has a dozen sniffs a day at them. I guess it is the spring perfume that gets them.

Have you seen those bread brooches that some of the country women make? My aunt sent me one for my birthday, and it is the sweetest thing. The girl who makes them must have very delicate fingers, as they are so dainty. She



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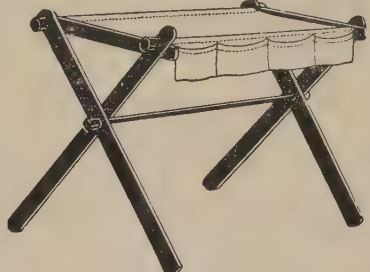


Table for DRYING and DRESSING Baby

The strong white duck makes a firm but yielding table for baby's tiny body. Folding frame of stained kauri with handy pockets for pins, talc, etc.

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NORTON'S

THE
EGG
PRESERVER
THAT
NEVER FAILS

makes them in all colours, and all different flowers, most of them are like an old-fashioned nosegay. I have seen one that is two rows of pink lilies, and another is a cyclamen posy, and they look rather like barbola work, but no—they are made from bread.—Cayenne, Wellington.

I HAVE had a dear sister staying with me, and as she had recently had a very trying operation, I was delighted to be able to have her with me, and help her even a little on the road to recovery. Her health had become sadly undermined before she attended to it, with the result that it was all the harder to pick up the threads again

where one likes to see them. I am thankful to say she had a marvellous "come-back," but I do think we should all count the cost ere we drain the



Content

A small house,
A poplar tree,
A small dog,
And small me.
And small me.
And big you
To come to tea . . .
Wouldn't that
Be heavenly!



dregs of our endurance. A little quiet contemplation of matters often leads us to a better insight and understanding of the things that matter. One of our neighbours from Pleasant Point says this also, and I often feel that illness, be it for a day or longer, is sent to us for a definite reason, and, as has been said, if we see our mistakes today, then we will be wiser tomorrow.—Roundabout, King Country.



CHECKERS

now at the H.B. Men's Store . . All-wool DRESSING GOWNS

The gown illustrated depicts the new contrasting over-check designs obtainable in a variety of colourings with silk cordings and girdles to match. Wonderful value and cannot be replaced at anything like 69/6.

Also at 69/6 are plain colours, including Camel, Bottle, Maroon, Light Navy, and Nigger. Silk cordings and girdles. Supply limited—prompt buying advisable.

The 6 coupons needed go further because of H.B. QUALITY.

Hallensteins

29 H.B. MEN'S WEAR STORES—WHANGAREI
TO INVERCARGILL.

69'6



Our Competition

The Most Amusing Incident in My Life

THIS competition gave me lots of fun, and I certainly had some good laughs over your funny experiences. I wish I could print more, but I think you will have a few good chuckles over those I have managed to use.

First prize to "Gerrie Mac" of Dunedin (I am sure we will all sympathise with her!), and second to "Cayenne," Wellington.

First Prize

RECENTLY I had occasion to buy a new pair of corsets, and, much against my better judgment, I allowed the salesgirl to sell me a pair a size smaller than I usually wear. Before going to bed that night I decided to try on my new purchase, and after about half an hour's struggle I finally managed to enclose myself in the corsets. Then I found I couldn't get out of them, so hubby had to come to the rescue, and after much breathing in, and holding of breath, he managed to release me. I did not feel equal to getting into the corsets first thing in the morning, so waited until the family had gone their ways before I again attempted to control my curves. However, I must have gained inches in the night, because the corsets wouldn't meet. What was I to do now?

Then I remembered being fitted in my early married days by a very smart young corsetiere, and she had advised putting the corsets on lying down, so I thought I would try that, and hey presto, the corsets went on in a twinkling! But worse was to follow. Here I was, lying on my back, firmly encased in a straight jacket as it were, and I couldn't get up or down. After a good deal of wriggling, I finally reached the edge of the bed, and with a great heave, I rolled on to the floor, and landed in a sitting up position, then I got to my

feet. As pride feels no pain, I struggled through the day in my straight jacket, and I am sure I have been fully repaid for the extra effort, because as the advertisement says, I have smoothed out all the bulges and wrinkles and have truly lost my pot! Now I am wondering, should I repeat the performance.—Gerrie Mac, Dunedin.

Second Prize

ONE or two of the paragraphs re the elastic shortage tempts me to tell you of rather an amusing incident which happened to me recently. One of my soldier boy friends in Suva had written and asked me if there was anything I would like him to get me as a present over there, so I wrote back and said that I couldn't really think of anything except some white elastic, as things were becoming rather serious over this way through not being able to obtain any. His next letter contained the information that he had hunted all over Suva and had two of his friend also searching, but no elastic was to be had anywhere.



Spring is in the air, and why not greet it with a new hat? This style, as worn by a star from Metro-Goldwyn-Mayer studio, is smart and dashing—a fine white straw, trimmed with navy—and would smarten up any outfit.

SPECIAL FOR HOME DRESSMAKERS!

Send 10/- Today for the Special Druleigh Text Book for

HOME DRESSMAKERS.

Shows you how to cut a foundation pattern to any measurements, how to cut patterns for simple skirts, blouses, sleeves and collars, how to take measurements. Shows you how to do those expert finishing touches that distinguish the professional dressmaker . . . smocking, fag-goting, pockets and buttonholes, setting in sleeves and attaching collars, special hints for dressmakers.

All purchasers will receive a foundation pattern cut to their own measurements FREE!

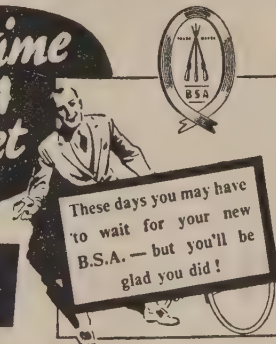
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THE BICYCLE THAT LOOKS PERFECT—
IS PERFECT—AND STAYS PERFECT.



3

Good weather for ducks . . . and Rainsters!



In her Rainster she's as dry as a duck under its feathers; as snug and as warm. Kiddies take to the wet like ducks to water—and as safely—inside their Rainsters. For like water to a duck's back is rain and wind to a Rainster. (And who ever heard of a duck catching a chill!) Rainsters are leakproof (all seams are taped) and windproof, as well as waterproof. There's real British doggedness in the wear of that British fabric. And you'll be so proud, so happy, so sure, with your perfect little ducks in Rainsters!

APOLOGY

To get your Rainster might mean a bit of a hunt. But it IS worth it. We apologise. We are doing all we can to make it easier, but our war-work is of first vital importance. You will agree with that, we know.

KIDDIES TAKE TO WATER LIKE DUCKS—IN A RAINSTER

However, he mentioned that he was sending me a parcel just to go on with, so that "things" wouldn't get, as he put it—too let down. The said parcel duly arrived, a nice big lumpy one, and I anxiously tore off the wrappings. What do you think it was? A pair of very dainty white celanese scanties, lace trimmed, and sewn firmly to the top by thick black cotton were eight sturdy Army buttons to which were attached a pair of men's braces. You can imagine my face, especially as it was delivered to the office, and naturally all the girls were crowding round to see what was in the parcel. Incidentally by the next mail I received two yards of the precious white elastic, which had been discovered in some tailor's shop in one of Suva's most out-of-the-way streets. The tailor had only three yards, and he would only sell two. I heard later from another returned soldier that they had to pay 3s. a yard for elastic over there, so it was a worthy gift. —Cayenne, Wellington.

WHEN my father was pleased with some special work we children had completed, he would sometimes say: "Good! I may take you to Ireland some day." One day my young brother, aged nine years, had pleased him greatly, and as usual Dad came out with the old familiar phrase, "I may take you to Ireland some day" And little brother thought Dad said "Monday." So next day he went to school, and told teacher that he was leaving school, as he was going to Ireland on Monday. Teacher put on a little farewell concert for brother, and got him to sing a farewell song. Poor Bill was quite upset when he found he had to go to school on Monday instead of starting for Ireland!—Tartan, Auckland.

AS a result of the morning's cooking, a large fruit cake reposed on the pantry shelf, waiting to be packed up to be sent overseas. The next morning young son

aged three-and-a-bit had a little boy friend over to play with him and as they were so quiet I started to investigate. Lo and behold! all that was left of my cooking was a few crumbs on the floor beside the guilty ones. Later on, father was asking son why he had done it. "I didn't eat any," he assured his father, "I ate it all." "And what did it taste like?" A large grin spread all over

son's face, and "Gee, it was good!" came the reply.—Pigtails, Wellington.

Competitions

SEPTEMBER

This month's competition closes on **October 15**, and do you remember what it is about? Turn up the last copy of your "Journal," and you will see that the subject is "Milestones."

OCTOBER

A letter from one of you recently said: "With so many women taking the place of our men on the land, could we have a competition on 'My Dream Cowshed'? I think many helpful suggestions may come to light, and the female idea of a dream cowshed may prove a vast improvement on the average shed of today."

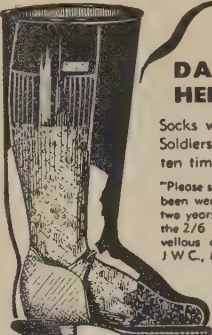
So there it is for you:

"MY DREAM COWSHED."

For the first prize there is 10s waiting to be won, and 5s for the second. Post your entries before **November 15**, to:

"MARY,"
C/o "Journal of Agriculture,"
P.O. Box 3004,
WELLINGTON.

THE most amusing incident I recall was when, as a young woman I went with my mother to return a first call. The lady we visited was an old "die-hard" of the Victorian school, and rather eccentric. We were ushered into the drawing-room by a neat maid, properly attired in black, with cap, cuffs, and apron. Our hostess rose to greet us, and her manner was so "grande dame" that for a few seconds I did not perceive that she had forgotten to put on a slip, and I will never forget the sight of those white embroidered drawers, which came a little below her knees, and which were



NO DARNING OR HEEL BLISTERS

Socks worn with Gum Boots, Soldiers' Boots, etc., can last ten times as long!

"Please send me another pair. I have been wearing them now for nearly two years. They are certainly worth the 2/6 My wife says they are marvellous owing to no darning!"
J W C., Millerton, 8/1/42

2/6 Pair
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Railway Wagons and Tarpaulins

Speed Them on Their War Work

Raw materials, food and equipment for the Fighting Forces and for our own Industrial Front must be moved smoothly and uninterruptedly to and from factories, farms and ships. This is the railways' job. It's a big job and it's getting bigger and bigger all the time. Every railway wagon and every tarpaulin must work non-stop. All-out co-operation is essential. EVERYONE—staff, consignors and consignees—must realise that half-help won't do. It's hundred per cent. practical co-operation that's needed.

Hurry Your Loading; Speed-up Your Unloading

Wagons and Tarpaulins Must Work Full-Time

so slightly veiled. She swept across her large drawing-room twice during our stay, so we had views from every angle. I glanced at my mother, but her face was set. We behaved beautifully, but I was thankful when mother rose to leave. I at least made the welkin ring as we drove home.—**C.I.B., North Auckland.**

THIS amusing incident happened just recently, while I was acting "Land Girl" during the absence of my husband at Home Guard. Caring for

the sheep was my job, and putting them on the green feed for a short period each day. While bringing them up one morning I noticed one sheep loitering behind the others, and not looking very energetic, but she got there eventually. Later, when moving them off, this one was still very sorry for itself, so I didn't bother her, as I thought perhaps there would be a little lamb if I took a look after a while, for already there were four little frisky lambs in the paddock. So the other sheep were safely put away

for the night, and when Hubby arrived home, I was relating the day's performances, feeling very pleased with my shepherding, and advised him to take a look at the "old girl who was left behind." On his return, with a grin on his face, he announced that he didn't think the "old girl" would ever produce a lamb, as "she" was an "old boy!"—**Blue Bell, Temuka.**

Lady, we salute you!

Salute to a woman in uniform! She earns it by the job she does. Earns it again by the way she looks. Impeccable grooming, shining competence . . . one of an army of many smart girls.

Good looks in uniform depend upon a Berlei to tactfully suit austere lines to feminine curves. Competence depends largely upon a woman's ability to stand up to long hours and unremitting strain. Here again, Berlei's her faithful ally. The well-corseted figure, women war-workers have discovered, *can* take it! A Berlei braces delicate, unaccustomed muscles against strain . . . keeps the body in good posture so that it tires less quickly. No war-working woman, however strong, however fit she may imagine herself, should be without a Berlei!



Mary's Mixing Bowl

Favourite Recipes

THE prize of 2s. 6d. for the best recipe is awarded to "Fussy," Motueka, for the following entry:—

ABERDEEN SAUSAGE.

1 lb. blade or topside steak, $\frac{1}{2}$ lb. fat bacon, 2 small teacups fresh breadcrumbs, 1 dessertspoon Worcester sauce, 1 egg, 1 teaspoon salt, 1 teaspoon pepper.

Mince steak and bacon very fine. Add other ingredients. Mix well, and add egg well beaten. Form into a roll. Tie in floured cloth and boil gently for $2\frac{1}{2}$ hours. Roll carefully out of cloth. Cover thickly in breadcrumbs while hot. Serve cold.—"Fussy," Motueka.

GINGER SNAPS.

$\frac{3}{4}$ lb. wheatmeal (fine), $\frac{1}{4}$ lb. sugar, $\frac{1}{4}$ lb. butter, 3 tablespoons syrup, 2 teaspoons ground ginger, $\frac{1}{2}$ teaspoon baking soda, pinch salt.

Put butter and syrup to melt. Mix dry ingredients and stir in melted butter and syrup, kneading well. Place on tray in balls and flatten slightly. Bake in moderate oven.—"M.S.," Waimate.

MARMALADE PUDDING.

2 tablespoons butter, 2 tablespoons sugar, 2 tablespoons marmalade, 1 breakfast cup flour, 1 teaspoon baking soda.

Rub butter into flour, dissolve in milk and sugar, add marmalade, and mix into stiff dough with milk. Steam 2 hours. (A delightful sponge pudding, serves 4). It can be varied by using

syrup instead of marmalade, and adding spices or ginger, or using dark jam instead of marmalade.—"Gerrie Mac," Dunedin.

Recipes Wanted

THE "Mixing Bowl" welcomes new recipes, and each month a prize of 2s 6d is awarded to the best seasonal recipe received. This month's competition closes on **October 15**, and recipes should be sent to "The Mixing Bowl," c/o "Journal of Agriculture," P.O. Box 3004, Wellington.

ALMOND FINGERS.

$\frac{1}{2}$ lb. flour, 1 egg, yolk and white separated, 4 oz. butter and 2 oz. sugar, 1 teaspoon baking powder.

Beat butter and sugar to a cream, add yolk of egg, beat well. Add flour and baking powder. Mix with hand to a stiff paste. Roll out thin on floured board. Spread icing over paste and sprinkle with chopped nuts. Cut into fingers and place on a cold oven shelf.

CHEESE SOUFFLE.

1 cup of milk, 1 cup grated cheese.

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Heat until cheese softens, then add 2 egg yolks, well beaten, 1 cup of breadcrumbs, and seasoning. Add white of eggs beaten stiffly and cook in oven.

JOHNNY ALL SORTS.

3 oz. butter, 1 breakfast cup flour, 1 egg, flavouring, nuts or fruit, 1 teacup sugar, 1 teaspoon baking powder.

Cream butter and sugar; add egg and dry ingredients. Bake in moderate oven.

ELSIE'S FINGERS.

$\frac{1}{4}$ lb. butter, 3 oz. sugar, 1 egg, $\frac{1}{2}$ teaspoons baking powder, 2 small cups flour.

Cream butter and sugar, add egg, then flour mixed with baking powder; roll small pieces between the hands; dip in sugar and put on cold tray.

ANZAC BISCUITS.

$\frac{1}{4}$ lb. butter, $\frac{3}{4}$ cup flour, pinch of salt, 1 tablespoon golden syrup, $\frac{3}{4}$ cup sugar, 1 cup cocoanut, 1 cup oatina or rolled oats, 1 teaspoon soda dissolved in 1 tablespoon of boiling water.

Melt butter, add syrup, then soda dissolved in 1 tablespoon of boiling water, beat for a minute, add the other ingredients. Put on a cold greased sheet. Bake till a nice brown top and bottom.

LEMON PATTY CAKES.

2 eggs, $\frac{1}{2}$ lb. sugar, 1 heaped cup flour, $\frac{1}{4}$ lb. butter, 1 lemon (grated rind and juice), 1 teaspoon baking powder.

Bake in greased patty tins, decorate with lemon icing.

CUSTARD MOULD.

2 eggs, 1 oz. of castor sugar, $\frac{3}{4}$ oz. of gelatine, 1 pint of milk, 1 tablespoon of brandy, vanilla.

Put the gelatine and castor sugar into a basin; boil the milk and pour it on. Add sufficient coffee essence to flavour the milk well. Stir in the basin from time to time, until the mixture becomes creamy. Set in a mould rinsed with cold water. When firm, turn out.

HUNGRY BOY'S CAKE.

$\frac{3}{4}$ lb. brown sugar, 1 egg, a little milk, $\frac{1}{2}$ lb. dripping, small piece butter, $\frac{1}{2}$ lb. sultanas, a little finely-chopped peel and spice, 1 lb. flour, and 1 teaspoon baking powder.

Warm the fat slightly, and beat up with the sugar to a cream. Add the egg, milk, fruit, and spice; lastly, stir in flour and baking powder, adding more flour if too soft, or a little milk

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if too stiff. The mixture should look rough. Put in a greased tin, and bake in a hot oven for half an hour or so; then slower for a further hour until risen and brown.

NUT LOAF.

1 lb. flour, $\frac{1}{4}$ lb. sugar, 2 teaspoons baking powder, $\frac{1}{2}$ pint milk, 1 egg, walnuts (chopped), pinch salt.

Mix all the dry ingredients together; add beaten egg and milk; put in well-greased tin and bake one hour in good oven.

SHORT PASTRY.

6 oz. flour, 3 oz. dripping, pinch salt, $\frac{1}{4}$ teaspoon baking powder, water to mix.

Rub dripping into the flour with fingers, add salt and baking powder. Mix to stiff paste with water; roll out and use as required.

THREE MINUTE CAKES

1 breakfast cup sugar, 1 breakfast cup flour, 1 teaspoon baking powder, 3 eggs, 2 tablespoons water, 2 tablespoons butter.

Mix all together and beat up for three minutes. Add baking powder before putting in well-greased tin. Bake in moderate oven.

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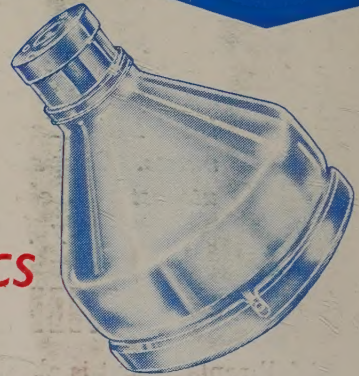
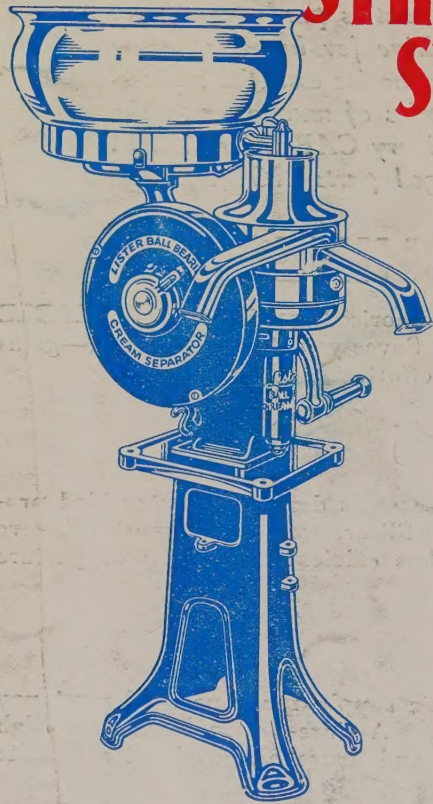
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